

Railway Age

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Car Loadings and Business

THERE has been recently much talk of a "slump" in general business. There have been sharp declines in prices on the grain and stock markets, but car loadings are a good index of general business activity, and they do not show the effects of any general decline of production or commerce. In January the number of tons of freight carried one mile was almost 10 per cent greater than in the same month of last year. In February the business handled was less than last year, partly because the month was one day shorter. In March loadings were larger in every week than in March, 1924. In the first thirteen weeks of the year coal shipments were 119,606 car loads less than last year, but shipments of other commodities were 297,567 car loads more. In the week ended March 28 coal shipments were 13,791 car loads less than last year, but shipments of other commodities were 37,638 car loads larger. Since there are now probably 25 million tons less coal in storage than there were a year ago, it does not seem probable that coal shipments will long continue to be as small as they are now. Shipments of merchandise and less than car load freight thus far this year have been larger than ever before and in the week ended March 28 amounted to 262,575 car loads, which was a new high record. In the same week shipments of forest products were the largest ever reported except in two weeks. It is impossible to find in such facts any evidence that there has been a decline of production and commerce in general.

The Growing Use of the "19" Train Order

WITH the gradual increase in the number and length of freight trains it is becoming more important that unnecessary train stops be eliminated. Therefore operating officers who are being confronted with the necessity of utilizing existing track facilities to the limit of their capacity are looking with increasing favor on the more extensive use of the non-signature "19" form of train order in preference to the "31" form which requires a train to be stopped to secure the signature of the conductor. Especially on single track lines the delay to one train stopping for a "31" order is frequently reflected in further delays to other trains with which it may have meet orders. The advantages of the "19" form are recognized by the majority of operating officers and many roads are now profiting by the use of this form in preference to the "31". Nevertheless some officers still hesitate to use the "19" exclusively on account of the fear that it is not as safe as the "31" form. On account of the rapidly changing attitude on this question during the last five years and the extensive adoption of the form "19" the *Railway Age* has conducted a contest on the use of the "19" train order. Several of these papers were published in the issue for February 21; another is published elsewhere in this issue. These papers not only show that

the "19" order effects a great saving in time but they also present proofs that with certain limitations it is as safe as the "31". Many of the authors advocate the exclusive use of the "19" order while others still use the "31" in a few special cases. Some roads have developed clearance cards, dispatcher's recording sheets, etc., which are used to check the delivery of orders in a manner to ensure safety of operation with the "19" form and yet expedite trains. Whether using the "19" form or not, this subject deserves the best thought of railroad officers today.

The Menace of Foreign Competition

AT intervals one hears of the purchase of small quantities of rails in Belgium or Germany for use in this country. These reports are followed immediately by manifestations of the fear that these orders are the vanguard of a European industrial invasion which will have a disastrous effect on our industries; including our transportation system. The railways are interested in the prosperity of the steel industry as well as other industries because of the effect which this prosperity has on the traffic of the roads. As practically the sole users of rails, they are also interested in the relation between the costs of domestic and foreign rails. That little need be feared from foreign competition is indicated by the fact that only 43,357 tons of rails were imported into the United States in 1924, whereas 209,211 tons were exported. Of the rails imported into the United States 22,719 tons came from Belgium, 6,998 tons from Germany and the remainder from France, the Netherlands, England and Canada. Of the rails exported 47,803 tons went to Cuba, 34,263 tons to Japan, 18,357 tons to Canada and the remainder in smaller quantities to a large number of countries.

More Comment on Ford Railroad Methods

THE current issue of "The Railroad Trainman," journal of the Brotherhood of Railroad Trainmen, contains a discussion of the operating practices on the Detroit, Toledo & Ironton which is, for the most part, well founded and constructive. It is calculated to relieve the minds of the brotherhood members of the idea that a sort of Utopia of high wages is to be found in the service of the D. T. & I. That the wages paid the employees are high is not to be denied, but the conditions under which the pay is earned are such that they would cause the average railway employee to hold up his hands in horror at the thought of working under them. What those conditions are was pointed out at length in the article on the D. T. & I.'s operating practices which appeared in the *Railway Age* of February 28. The Railroad Trainman cites complaints from men employed on the D. T. & I. against their work-

ing conditions and the "arbitrary manner in which they are directed by their superior officers of all degrees." It adds that letters have been received from employees of the D. T. & I. saying that it is their belief that if the men were permitted to vote on exchanging the present rates of pay for going rates on the standard railroads with their working conditions, rights of appeal, assurance of promotion and advantages enjoyed by employees on other railways, they would be willing to trade off the higher wages for more considerate terms of service. The Railroad Trainman does not agree with this suggestion, nor do we. Given a choice between money and more pleasant working conditions, it is only human nature for men to choose money. It is the conclusion of the Railroad Trainman that men employed on the D. T. & I. are held to the service solely by the rate of pay. This may or may not be true. The Railroad Trainman makes one statement, however, with which we do not agree. It says, "We believe that if all employers of labor, particularly the railroads, would adopt Mr. Ford's methods for paying his employees, the voice of the grievance committeemen would not be heard in the land." One reason for such success as Mr. Ford has had with his methods of operation and of handling his employees is that his is the only railway in the country which applies such methods. If all the railways were to advance the wages of their employees to a parity with those in effect on the D. T. & I., the employees would undoubtedly feel very contented and satisfied at first. But this state of mind would not last. After the novelty of comparative affluence had worn off, the old dissatisfaction would crop up again and the old battle for even higher wages would be reopened. That, too, is human nature. One fact remains that railway employees will do well to bear in mind. It is that Ford wages go only with Ford methods. The result of an effort to introduce Ford wages with Ford methods on all railways probably would be a general strike. The introduction of Ford wages without Ford methods, would inevitably bankrupt every railway in the United States.

Will Railroads' Rail Requirements Decrease?

THE reduction in the quantity of rails rolled from 2,904,516 tons in 1923 to 2,433,332 tons in 1924, as indicated in another column, should not be interpreted too strictly as an indication of relative maintenance activity and a measure of maintenance expenditures for it is the result of a number of influences. On the one hand, the constant replacement of rails with those of heavier section increases the tonnage required per mile of track relaid, although the ultimate effect of the heavier sections is to reduce the tonnage by reason of the relatively longer life secured. The constantly improved standards of maintenance also influence the life of rail, for with more and better ballast and more care in surfacing, the deterioration of the rail under traffic is reduced materially.

However, the decrease in the tonnage of rails rolled reflects more directly the increased life which is being obtained from rail by reason of those measures which have come into common use in recent years to arrest or overcome deterioration and thereby extend its period of usefulness. Rail deteriorates primarily at the joints and it is the condition at this point that determines the necessity for its renewal. The shipment of rails to a certain plant where these battered ends are sawed off and the rails redrilled and returned to service in either main or secondary lines is a practice of long standing. It has

been followed particularly on those roads with large mileages of branch lines where a program of rehabilitation of these secondary lines has been in effect. On these roads the demands of the branch lines have frequently controlled the rail program. On those roads where little or no rail is required for these purposes, numerous attempts have been made to devise means for sawing the battered ends off these rails without removing them from the track without any marked success.

Another method which has been more generally followed and which has attained greater success is the use of stronger joints which stand up more successfully under traffic. Furthermore, the practice is increasing rapidly of applying new joints to rail as soon as the rail shows evidence of deterioration, thereby bringing new bearing surfaces of proper contour into play and arresting any tendency for the ends of the rails to deflect. While the proper time for the renewal of these joints varies with the density and character of the traffic, it is a common experience for rail on tangent track to outlast two sets of joints. One large western road which has studied this subject carefully has found that under the conditions prevailing on its lines, the joints begin to go down during the fourth year of service and it, therefore, gives rail of this life special attention to ascertain the desirability of reinforcing it with new joints.

Another development of relatively recent years is the building up of battered rail ends by welding metal thereon. In this practice, those depressions which form near the ends of the rail and which cause rough riding track are filled with metal and the original contour restored. This practice has come into widespread use on many roads where it has been found to extend the life of rail at least two or three years and has cut down renewal requirements in proportion.

A further factor which will be of no small consequence when its full effect is evident is the reduction in the number of joints which will come about in large measure this year through the general increase in the length of rails rolled from 33-ft. to 39-ft. Measures such as these, which have for their object the improvement of the rail at the joint, thereby extending its life at this point more nearly to that throughout the remainder of its length, will do much to reduce the tonnage of rail required, thereby enabling the roads to devote the money heretofore spent for new rail for heavier sections, better joints and a higher standard of general track maintenance.

Fluctuations in Equipment Purchases

THE orders placed by the railways for locomotives within recent months have been so small that the builders are almost out of work. This situation again calls attention to the violent fluctuations that occur from year to year, and even between different parts of the same year, in the purchase of railway equipment and supplies. These fluctuations and their effects often have been discussed, but no real effort has been made to reduce them. In the interest of the welfare of the country, and especially in the interest of the railways themselves, a study ought to be undertaken with respect to the causes of these great fluctuations, the effects they produce and the means, if any, that ought to be adopted to reduce them.

The recent decline in orders for locomotives is anomalous in one respect. Fluctuations in the buying of equipment usually in the past have corresponded with fluctuations in the net operating income earned. Orders

usually have increased after net operating income has increased and declined after it has declined. During the last eight months the railways have been earning the largest net return in several years, and yet orders for locomotives have declined.

In considering whether there is good reason from a transportation or economic point of view for the large fluctuations that occur in the purchase of locomotives, it must be borne in mind that they are bought for two purposes; first, to replace locomotives that are worn out or obsolescent, and secondly to increase the amount of tractive power available sufficiently to handle increased business. Almost invariably the new locomotives acquired have a greater tractive power than those retired. Consequently even if the number of locomotives installed annually were only equal to the number retired there would be, under the practice of our railways, a steady increase in total tractive power available. The demands of increased business always have been so large, however, that over periods of years it has been necessary largely to increase the number of locomotives as well as their average tractive power.

There is something almost weird about the statistics showing the way in which the increases in the total number and tractive power of locomotives have been accomplished. From June 30, 1910, to December 31, 1924, inclusive, a period of about 15 years, the average number of locomotives retired annually by the Class I roads was 1,756, or 2.8 per cent of the average number owned. The average number installed in service annually was 2,447, or 3.9 per cent of the average number owned. There was not, however, even a remote approach to uniformity in the number retired and acquired from year to year. The number installed varied from a minimum of 1,017 in 1920 to a maximum of 4,381 in 1913; and the number retired varied from a minimum of 977 in 1918 to a maximum of 3,672 in 1923. There were violent fluctuations in both installations and retirements in immediately consecutive years. In 1913 the number installed was 4,381 and the number retired 2,338, the net increase in number being 2,043. Two years later, in 1915, the number installed was only 1,114 and the number retired 1,507, the net decrease in number being 393. In 1920 the number installed was 1,017; in 1921, 1,330; in 1922, 1,226. In 1923 it was 4,037, or substantially more than in the three preceding years combined. Since last August, traffic and earnings have been relatively good, and yet in the five months that ended with January the number of locomotives put in service was only 916 while the number retired was 1,151. Furthermore, the orders placed with the builders in the first three months of this year amounted to only 182.

Since during the last fifteen years 2.8 per cent of the average number of locomotives in service in each year has been retired annually it would appear that the average life of a locomotive is now about 35 years. The locomotives that are bought in any year are not bought merely to help handle that year's traffic, whether small or large. They are bought to help handle traffic for about a third of a century. Nobody can accurately estimate what increase in traffic there will be in future, and therefore, nobody can estimate accurately how much of an increase should be made in the total amount of tractive power available. Everybody knows, however, that at all times locomotives are being worn out, that they will continue to be worn out, and that in the long run those worn out must be replaced at a rate which, at the very least, will maintain the existing supply of tractive power. If they are not acquired and retired at least at this rate in one year, the deficiency in acquisitions and retirements must be made up later. Why, then, are there such large fluctuations in the number acquired from year to year?

It may be said that from a transportation standpoint it makes no difference whether a large number of locomotives is acquired in one year and a much smaller number in the next, provided the amount of tractive power is always kept adequate. But how about the economics involved? If the locomotive builders are called upon to build, say, 4,500 locomotives in one year, and only 1,200 in the next, they must maintain a capacity for turning out 4,500 locomotives a year. This means, that their overhead cost per locomotive must be much greater than it would be if they were called upon each year to turn out the average number of locomotives required annually for replacements and additions. But overhead is not the only cost involved. When orders decline to a low ebb the builder must largely reduce his labor force. When orders largely increase he must correspondingly increase it. Recently within a single period of ten months a big increase in orders made it necessary for one of the large locomotive builders to increase its working force from about 4,000 to about 21,000 men. Such huge fluctuations in labor forces greatly augment labor costs. These things necessarily increase largely the average cost of producing locomotives. In the long run the railways bear this increased cost in the prices they pay for locomotives; and the resulting high prices enter permanently into their fixed charges.

We have used the fluctuations that occur in locomotive purchases for the purpose of illustrating a general situation, and particularly because it is well known that at the present time the locomotive builders are much in the same condition as the man who was all dressed up and had no place to go. Relatively large fluctuations occur, however, in all kinds of railway purchases and produce much the same results. The present situation with respect to locomotive orders is partly explained by the fact that the railways have been able lately to handle a large freight business while maintaining a substantial surplus of power. Within recent months the number of locomotives kept in storage has been about $7\frac{1}{2}$ per cent of the number owned. This is a substantial surplus; but a substantial increase in business would soon greatly reduce or wipe it out, especially if retirements should continue to exceed installations as they have within recent months.

Secretary Hoover has started a movement to reduce waste in American industry. The subject of stabilization of railway purchases, especially of equipment, merits very serious study in this connection. Why do the railways so generally refrain from ordering equipment for long periods, and then almost all rush into the market and buy at the same time? There are reasons for it—chiefly financial. But are these reasons good and adequate? Since locomotives, for example, are bought to be used for approximately one-third of a century, and since a large number must be installed annually on the average for replacements, why should not an attempt be made to stabilize at least the purchase of those required for replacements leaving the fluctuations to occur in the orders for those required to increase the total number? Greater stability in purchases would save the railways themselves large amounts of money. It would also tend to stabilize the business of the country; and the railways would derive benefits from that in the form of more stable traffic and earnings.

It is almost axiomatic in business that the best time to buy for future needs is when few people are buying and that the best time not to buy is when almost everybody is buying. The fact that such very large fluctuations occur in the total amount of equipment bought by the railways from year to year even within very short periods, although equipment is used from a quarter to a third of a century, shows that this axiom of business is very commonly disregarded in their buying.

How Should Maintenance Work be Organized?

AT its convention in 1901 the American Railway Engineering Association devoted considerable time to a discussion of forms of organization for the maintenance-of-way department. Presumably because of a feeling that this subject fell beyond the province of its membership it has not since been considered by that association. Whether or not lack of concerted studies of this subject by this or any other body is responsible, the fact remains that no other department of the railroads is subject to wider variation in form than that of maintenance-of-way. In this respect almost every railroad is a law unto itself.

It is doubtful whether any industry involves the application of so many branches of engineering or as diversified activities as those embraced by railway maintenance and it is an unfortunate fact that few railroads excel in all of them. One earns an enviable reputation in tie preservation; another in water treatment; a third in rail conservation. One has acquired leadership in the application of a mechanical device; another occupies an outstanding position in the economical operation and maintenance of motor cars; another takes an advanced step in the maintenance of its locomotive shops and terminals.

If a railroad enjoys a reputation for a high standard of efficiency in many or most of its maintenance-of-way activities the answer can usually be found in the head of the department or in the management itself. If the road has earned particular esteem for its record concerning one particular phase of maintenance work, the credit must usually be given to the man who is concerned primarily with that one activity and it will usually be found that he is a leader in his chosen field.

The prime need at present, it would seem, is not so much that of a further advance in the work done in these outstanding instances but a greater uniformity of excellence in the work of all branches of maintenance on all the railroads. Obviously the prime requisite for this is a head for the department possessed of a broad outlook on the entire field. The second is a staff of specialists in each of the more important branches of engineering definitely applicable to railway maintenance-of-way. The second requisite is exceedingly difficult of achievement by the smaller roads and points to one advantage of consolidation that has not yet been given much consideration. But other problems are involved, important among which are those relating to the form of organization. Most railroads are committed to the divisional organization under which the division superintendent's office is the clearing house through which measures set on foot by the system officers are carried into actual execution, particularly as they apply to maintenance-of-way and structures. This means that any tendency toward a subdivision of the direction of the maintenance work at the system office complicates its execution in the field. The natural result has been that that sub-department head is most successful in promoting his projects, who is most forceful or most tactful in presenting his interests to the division staff. Instead of strengthening the less effective sub-departments the tendency has been to accord increased attention to the strongest, which, while it affords the railway a maximum service from the ablest man may easily lead to the subordination of some important branches of the work.

As pointed out by Julius Kruttschnitt in a paper reported in last week's issue "it requires the closest kind of management . . . to meet all money requirements . . ." The first requisite for effective management is a corps of able executives at the head of all de-

partments. In the case of the maintenance-of-way department in particular, there is a definite need for a careful study of the plan of organization whereby measures will be taken to insure against a depreciation if not an actual neglect of certain phases of maintenance work that may easily lead to serious wastes in the expenditures made by this department.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Automotive Air Brake Equipment, by Westinghouse Air Brake Co. 55 p. Pub. by Westinghouse Air Brake Co., Wilmerding, Pa.

The Burlington in Nebraska. Address at Dinner Given by Greater Omaha Committee, Jan. 29, 1925, by Hale Holden. 18 p. Pub. by Chicago, Burlington & Quincy, Chicago.

The International Route, Eastward to the Sea, by Grand Trunk and Canadian National. 67 p. Pub. by Canadian National Railways, Montreal.

Publicity. Some of the Things It Is and Is Not, by Ivy Lee. 64 p. Pub. by Industries Pub. Co., New York, 1925. Chapter 3 Publicity as Applied to Public Service Corporations.

The Railroad Situation Today. Address before Omaha Chamber of Commerce, Jan. 29, 1925, by Hale Holden. 15 p. Pub. by Chicago, Burlington & Quincy.

Railway Operation in New South Wales, by New South Wales Dept. of Railways and Tramways. Bureau of Information. 15 p. Sydney, 1925. Overseas Bulletin, No. 23. Feb., 1925.

Railway Rates. How They Affect the Cost of Living, by Railway Clearing House. 21 p. Pub. by Railway Clearing House, London.

A Short History of American Railways, by Slason Thompson. 473 p. Pub. by Bureau of Railway News and Statistics, Chicago.

Periodicals

Express Faces New Postal Competition. Express Gazette Journal. April, 1925. p. 115-116.

History of the Chesapeake & Ohio, by W. J. Harahan (VIII). Shipper and Carrier. April, 1925. p. 5-7, 63.

How Traffic Has Been Shown Sufficient to Support New and Necessary Features in Oregon's Rail Transportation Facilities, by Peter C. Crockatt. Geographical Review. Jan., 1925. p. 90-107.

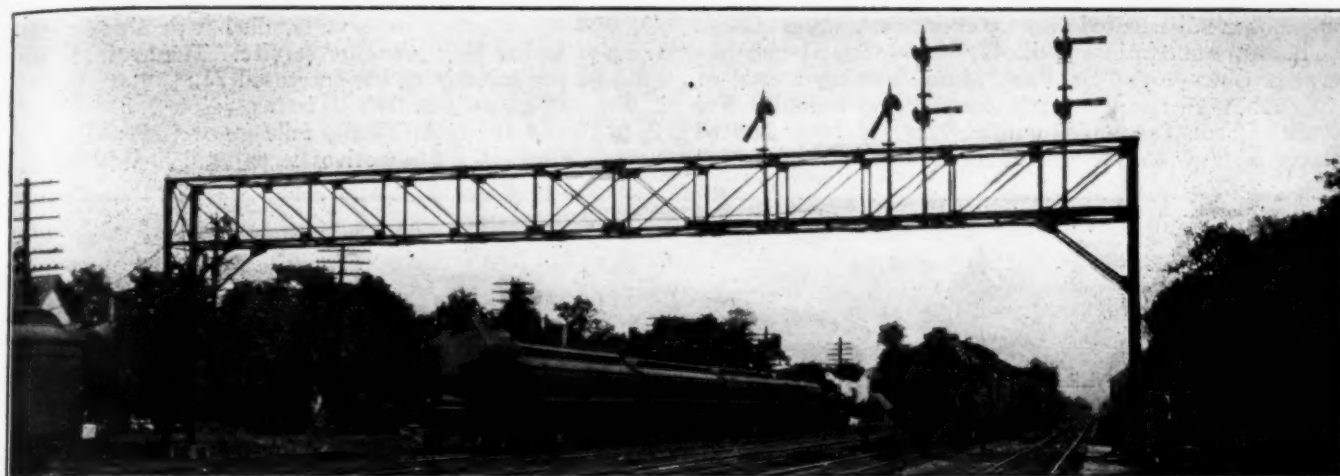
Joint Use of Railway Terminals, by E. H. Outerbridge. Port and Terminal. April, 1925. p. 17-18.

Making Freight Shipments Pay Profits, by Robert T. Kent. Management and Administration. Feb., 1925. p. 159-162.

Reorganization of the St. Paul, by Benjamin Graham. Magazine of Wall Street. (Issue of April 11, 1925. p. 1011-1013.

Separation of Railway Budget, by Rai Saheb Chandrika Prasad. Indian Economic Society Journal. Oct., 1924. p. 14-24.

Trans-Saharan Railway, by E. F. Gautier. Geographical Review. Jan., 1925. p. 52-69.



The Colorado Limited Passing a Local Suburban Train at Downer's Grove, Ill., at 60 Miles an Hour.

Long Engine Runs on the Burlington

Monthly savings exceed nine thousand dollars — Thirty engines released for other service — Hulson grades important aid

WHILE passenger locomotives of the Chicago, Burlington & Quincy were run through from Chicago to Burlington, Iowa, as early as 1911 the first regular long engine run on this road was put into effect in freight service between Alliance and Ravenna, Neb., in December, 1920; a passenger run between Wymore and McCook, Neb., was inaugurated in March, 1922; and in May, 1923, the first Burlington locomotive hauled train No. 2 from Denver, Colo., past three intermediate terminals to Lincoln, Neb., a distance of 485 miles and one of the longer coal-burning locomotive runs now regularly made.

In the past two years long engine runs have been extended quite generally over the Burlington System, giving the road an extensive experience which, under varying conditions, has demonstrated the value of this method of securing greater and more economical service

a mechanical point of view, by the substitution of Hulson grates for the common finger grates formerly used. With certain of the bituminous mine-run coals burned on the Burlington, 200 miles has been about the practical limit which a locomotive equipped with finger grates could run, owing to the accumulation of excessive quantities of clinker and ash. Tests have shown that with the new grates and the exercise of reasonable care on the part of firemen, these conditions are prevented and fires can be kept well beyond the mileage limit established by other considerations.

Experience on the Burlington indicates that the extension of locomotive runs over two or more divisions has practically no bearing on the cost of repairs per mile, but that real economies are to be found in the more intensive use of locomotives, the saving of enginehouse expense at intermediate terminals and in fuel economy. Moreover,

PRINCIPAL DIMENSIONS OF BURLINGTON ENGINES USED IN LONG RUNS

	0-1-A	S-1	S-2	S-3	B-1
Wheel arrangement	2-8-2	4-6-2	4-6-2	4-6-2	4-8-2
Tractive force	52,300 lb.	37,200 lb.	37,200 lb.	42,200 lb.	52,750 lb.
Grate area	58.8 sq. ft.	54.2 sq. ft.	54.2 sq. ft.	58.7 sq. ft.	78.0 sq. ft.
Total square feet heating surface	4,145 sq. ft.	3,699 sq. ft.	3,680 sq. ft.	4,115 sq. ft.	5,629.7 sq. ft.
Weight on drivers	214,550 lb.	150,000 lb.	153,100 lb.	171,300 lb.	235,500 lb.
Weight of engine	272,300 lb.	228,000 lb.	236,100 lb.	269,200 lb.	350,000 lb.
Total weight engine and tender	467,300 lb.	376,200 lb.	396,400 lb.	432,740 lb.	555,450 lb.
Cylinders	27 in. by 30 in.	22 in. by 28 in. and 25 in. by 28 in.	22 in. by 28 in. and 25 in. by 28 in.	27 in. by 28 in.	27 in. by 30 in.

from its motive power. On the system as a whole, the monthly and yearly savings and the number of locomotives released for other service are as follows:

SYSTEM SAVINGS, FREIGHT AND PASSENGER SERVICE, DUE TO LONG RUNS			
	Monthly saving	Yearly saving	Engines released for other service
Lines East	\$5,889	\$70,668	17
Lines West	3,537	42,444	13
Total	\$9,426	\$113,112	30

These savings have been made possible by the co-operation of all departments, and also to some extent, from

the release of certain engines has permitted a reassignment of motive power to runs where it can give a more efficient performance. For example, quite a number of engines designed primarily for freight service were used on passenger trains until the inauguration of the long runs enabled them to be released.

All of the long engine runs, both passenger and freight, now being made on the Burlington are shown in Tables I and III, the savings being given in Tables II and IV. The locations of the various terminals are indicated in the map which also shows how generally the

long runs are distributed over the entire Burlington system.

There are six trains (Nos. 47, 48, 49, 50, 51 and 52) between Chicago and St. Paul, Minn., making a total of 2,586 miles a day. Formerly these trains were handled by nine locomotives which number has now been reduced to seven. This has saved two locomotives and increased

motives, these trains are now handled with nine locomotives, releasing four for other service. The average daily mileage per locomotive has increased 71.

On the Nebraska district 10 trains, (Nos. 3, 5, 9, 15, 17, 2, 6, 14 and 16) make a daily mileage of 4,189. Prior to extended runs, 25 locomotives were used in this service,



Engine 2954 Steamed Up and Ready for Her Run

the average miles per day for these locomotives from 276 to 369, or 93 miles.

Between Burlington, Iowa, and Lincoln, Neb., there are six trains (Nos. 2, 3, 5, 6, 9 and 12) making a daily mileage of 2,070. Formerly handled with thirteen loco-

making the average daily mileage per locomotive 167. Under the new system 18 locomotives are being used, increasing the average daily mileage per locomotive to 233, or an increase of 66. These are but a few selected long runs. On the road as a whole the inauguration of

TABLE I—LONG ENGINE RUNS ON THE C. B. & Q. (LINES EAST)

Train Nos.	Present assignment				Former Assignment			
	Present terminal		Class of loco.	No. of miles	Former Terminal		Class of loco.	No. of miles
	Initial	Final			Initial	Final		
(Chicago-Savanna-St. Paul.)								
49-51	Chicago	St. Paul	S-1-A	431	Chicago	Savanna	S-1-A	145
50-52	St. Paul	Chicago	S-2-A	431	Savanna	St. Paul	S-2-A	286
47	Chicago	Minneapolis	S-1-A	442	St. Paul	Savanna	S-2-A	286
48	Minneapolis	Chicago	S-2-A	442	Savanna	Chicago	S-1-A	145
(St. Louis-Beardstown-Galesburg.)								
47-51	St. Louis	Galesburg	P-2	208	Chicago	Savanna	S-1-A	145
48-52	Galesburg	St. Louis	P-2	208	Minneapolis	Savanna	S-1-A	297
(Galesburg-Brookfield-Kansas City.)								
55	Galesburg	Kansas City	S-2	327	Chicago	Savanna	S-1-A	145
56	Kansas City	Galesburg	S-2	327	Minneapolis	Savanna	S-1-A	297
(Burlington-Creston-Lincoln.)								
3-5-9	Burlington	Lincoln	S-3	345	Chicago	Savanna	S-1-A	145
2-6-12	Lincoln	Burlington	S-3	345	Minneapolis	Savanna	S-1-A	297
25-7	Chicago	Creston	S-1	394	Chicago	Savanna	S-1-A	145
4-30	Creston	Chicago	S-1	394	Minneapolis	Savanna	S-1-A	297
77-79 (Frt.)	Galesburg	Creston	O-1-A	230	Chicago	Savanna	S-1-A	145
70-74 (Frt.)	Creston	Galesburg	O-1-A	230	Minneapolis	Savanna	S-1-A	297
(St. Joseph-Brookfield-Hannibal.)								
14-16	St. Joseph	Hannibal	S-2	206	Chicago	Savanna	S-1-A	145
15-17	Hannibal	St. Joseph	S-2	206	Minneapolis	Savanna	S-1-A	297
(Omaha-St. Joseph-Kansas City.)								
20-22	Omaha	Kansas City	P-5	197	Chicago	Savanna	S-1-A	145
21-23	Kansas City	Omaha	S-2	197	Minneapolis	Savanna	S-1-A	297
72 (Frt.)	Omaha	Kansas City	O-1-A	197	Chicago	Savanna	S-1-A	145
75 (Frt.)	Kansas City	Omaha	O-1-A	197	Minneapolis	Savanna	S-1-A	297

long engine runs has increased the average daily mileage of the passenger locomotives involved, by 72 miles, as shown in Table V, resulting in the release of 23 locomotives for other service. The total daily train mileage made is 14,607.

Reference to Tables I and III will indicate the pre-

engine between Cheyenne and Casper on the same trains and the Chicago, Burlington & Quincy furnished one engine between Casper and Cheyenne, making a total of three engines between Denver and Casper. The engine runs are now between Casper and Denver. One C. B. & Q. engine is being used instead of two Colorado & Southern

TABLE II.—SUMMARY OF SAVINGS EFFECTED BY LONG RUNS (LINES EAST.)

Train Numbers	Terminals Between	Passenger Service			Engines Released For Other Service
		Force Reductions	Fuel Savings	Total Approx. Savings Per Mo	
51-52-47-48-49-50	Chicago & St. Paul.....	\$1,950	\$450	\$2,400	2-Pacific Type C. B. & Q., Class S-2.
47-48-51-52	St. Louis & Galesburg.....	345	330	675	3-10 Wheel Type, C. B. & Q. Cl. K-10
55-56	Kansas City & Galesburg.....	296 (X)	165	461	1-Pacific, C. B. & Q., Class S-2
3-59-2-6-12	Burlington & Lincoln.....				
4-30	Chicago & Creston.....	550	495	1,045	4-Pacific, C. B. & Q., Class S-3
14-15-16-17	Hannibal & St. Joseph.....	...	330	330	1-Pacific, C. B. & Q., Class S-2
20-21-22-23	Kansas City & Omaha.....	150	330	480	1-Pacific, C. B. & Q., Class S-2
Total		\$3,291	\$2,100	\$5,391	12 Engines
Freight Service					
72-75	Kansas City & Omaha.....	None	178	178	1-Prairie, Class R-5
70-74-77-79	Creston & Galesburg.....	None	320	320	4-Mikado, Class O-2
Total			\$498	\$498	5
Grand Total Savings (Lines East)—\$5,889 per Month.					
Total Engines Released (Lines East)—17 Engines.					

*Payroll Saving Included in (X)

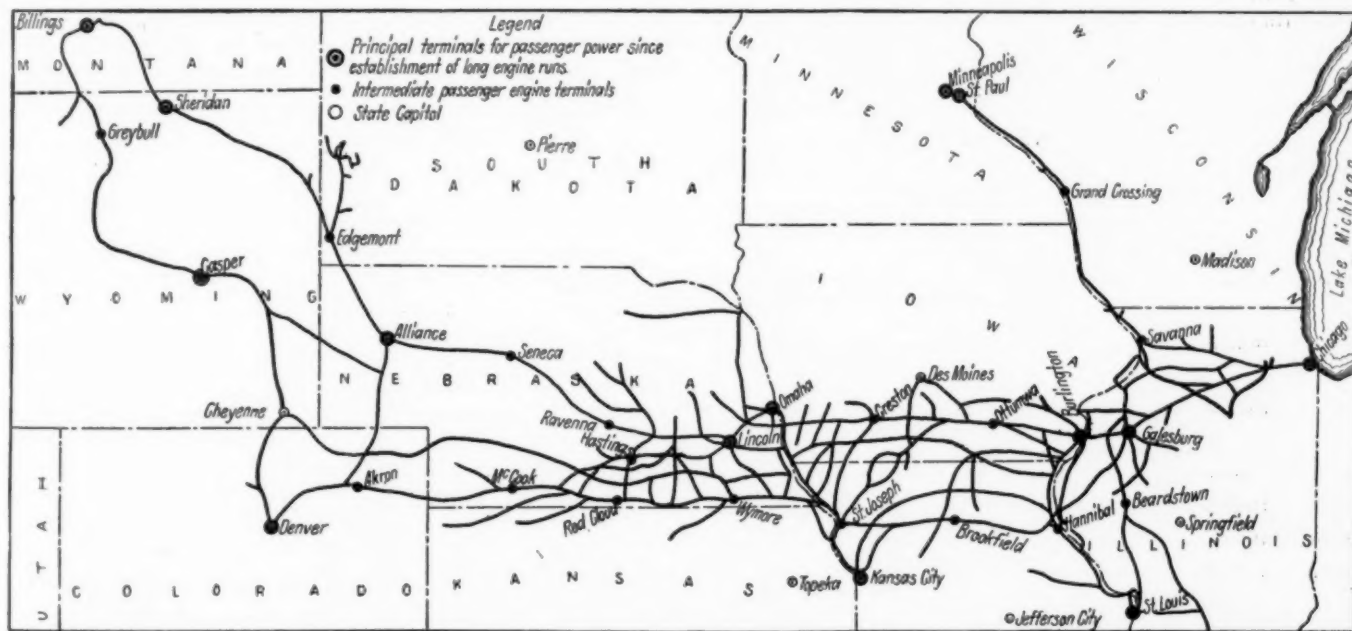
ponderance of passenger over freight locomotive runs. Long runs are being inaugurated in freight service, however, as fast as practicable.

In connection with the Lincoln-Denver runs it will be noted that eastbound there is no engine change but, owing to adverse grades westbound and the consequent heavy working of the locomotives, considerable more attention is required at McCook, Neb., than could be

engines to equalize the mileage since 240 of the 339 miles are on the Colorado & Southern.

Freight engines are run through from Casper and Greybull as business requires. A mixed class of power is in service, being used to the best advantage to fit the tonnage east and west of Bonneville.

In the freight pool between Alliance and Ravenna, Neb., twenty 0-1-A locomotives were formerly used. Since



Map of the Burlington System Showing the Principal Terminals Handling Passenger Power Since Long Runs Have Been Established

given without undue delay to the trains. As a result, train Nos. 3 and 9 change locomotives at McCook.

More or less the same conditions exist with regard to the Denver, Colo., to Billings, Mont., runs. All locomotives are changed at Casper, Wyo. Northbound they also change at Greybull but southbound they run through from Billings to Casper.

Formerly the Colorado & Southern used one engine between Denver and Cheyenne on trains 29 and 30—one

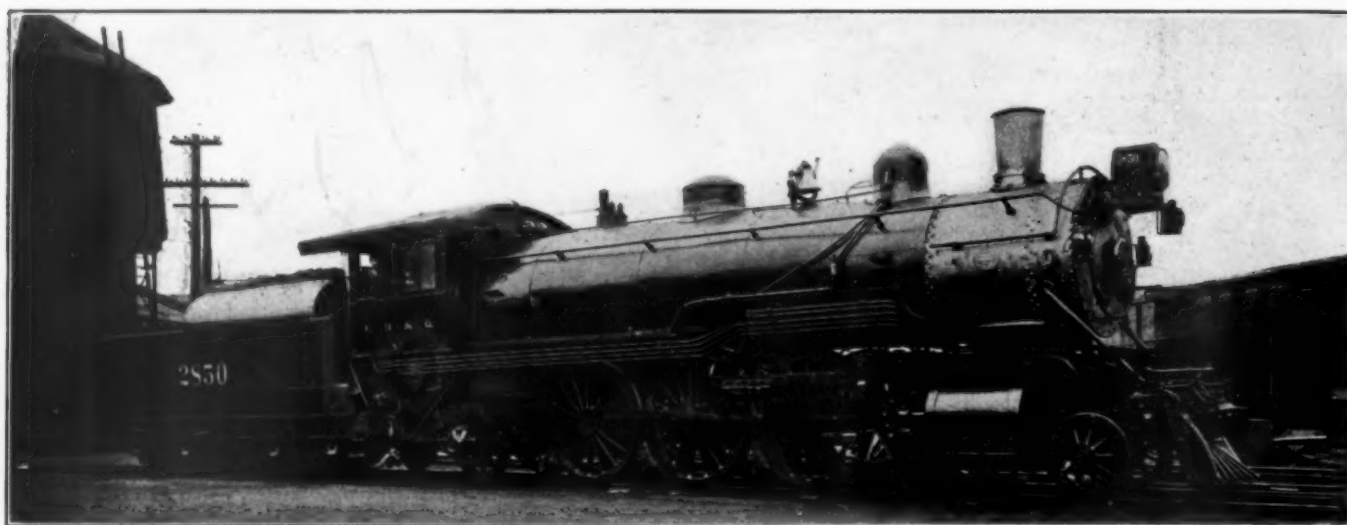
running through the terminal at Seneca without change, only eighteen locomotives are required, thus saving two 0-1-A locomotives.

Enginehouse and Fuel Savings

From a consideration of Tables II and IV it will be evident that on both the east and west lines of the Burlington the savings in enginehouse expense at intermediate terminals has exceeded the fuel savings. To a certain

extent increased attention at final terminals, more careful inspection at stations en route, the disposition of ashes when ash pans are cleaned away from regular terminals and other conditions necessitate additional expense. At many intermediate terminals, however, the operations of inspecting and caring for locomotives have been greatly reduced in magnitude so that a net saving for the system is obtained as shown in the tables. The work saved at

locomotives have their fires knocked at intermediate terminals and are later held under steam waiting for call. Every time a locomotive goes to a terminal there is more or less unavoidable waste of coal in keeping up steam pressure and direct loss to the ash pit. Before leaving, the fireman almost always throws on a few shovelfuls of coal to make sure that there will be steam enough to move the locomotive over the ash pit and, in heading, the host-



Engine 2850 Equipped with Hulson Grates Made 1,492 Miles in 121 Hours with a Single Fire

intermediate terminals consists of inspection, cleaning, knocking and rebuilding fires, washing boilers and normal repair work by enginehouse maintenance forces.

The fuel savings shown in the tables are conservative, being based quite largely on the number of fires saved and not taking into account the standby losses occasioned when

ler usually throws on a little more for the same reason. All of this coal, together with other unburned coal in the firebox, goes into the ash pit when the fire is knocked. This loss is in direct proportion to the frequency with which locomotives have to go over the ash pit. More coal is saved in winter than in the summer months owing

TABLE III.—LONG ENGINE RUNS ON THE C. B. & Q. (LINES WEST.)

(Lincoln-McCook-Denver.)								
Train Nos.	Present assignment				Former Assignment			
	Present Terminal		Class of loco.	No. of miles	Former Terminal		Class of loco.	No. of miles
	Initial	Final			Initial	Final		
3-5-9	Lincoln	McCook	B-1	230	Lincoln	Hastings	S-2	98
3-9	McCook	Denver	B-1	255	Hastings	McCook	S-3	132
6-2	Denver	Lincoln	B-1	485	McCook	Akron	S-3	143
			S-1	...	Akron	Denver	S-1	112
					Denver	Akron	S-1	112
					Akron	McCook	S-2	143
					McCook	Hastings	S-2	132
					Hastings	Lincoln	S-3	98
22	McCook	Lincoln	S-1	230	McCook	Hastings	S-3	132
					Hastings	Lincoln	S-1	98
(Wymore-McCook-Denver.)								
15-17	Wymore	McCook	S-2	228	Wymore	Red Cloud	S-1	108
15-17	McCook	Denver	S-1-A	255	Red Cloud	McCook	S-1	120
14-16	Denver	McCook	S-1	255	McCook	Akron	S-1	143
14-16	McCook	Wymore	S-1	228	Akron	Denver	S-1	112
					Denver	Akron	S-1	112
					Akron	McCook	S-1	143
					McCook	Red Cloud	S-1	120
					Red Cloud	Wymore	S-2	108
(Alliance-Sheridan.)								
41-43	Alliance	Sheridan	S-3	333	Alliance	Edgemont	S-3	111
42-44	Sheridan	Alliance	S-3	333	Edgemont	Sheridan	S-3	222
					Sheridan	Edgemont	S-3	222
					Edgemont	Alliance	...	111
(Denver-Casper-Billings.)								
29	Denver	Casper	S-3	339	Denver	Cheyenne	S-3	120
29	Casper	Greybull	S-2	202	Cheyenne	Casper	S-2	119
29	Greybull	Billings	S-2	127	Casper	Greybull	S-2	202
30	Billings	Casper	S-1	329	Greybull	Billings	S-1	127
					Billings	Greybull	S-1	202
					Greybull	Casper	S-3	127
30	Casper	Denver	S-3	...	Casper	Cheyenne	S-3	...
					Cheyenne	Denver	...	...
(Alliance-Seneca-Ravenna.)								
Pool† (Frt.)	Alliance	Ravenna	O-1-A	238	Alliance	Seneca	O-1-A	108
					Seneca	Ravenna	...	130

†There were 20 O-1-A engines in this pool running between Alliance and Seneca and Seneca and Ravenna. Since running these engines through from Alliance to Ravenna and return the pool has been reduced to 18 O-1-A engines.

to increased radiation losses and the necessity of keeping locomotives not in the enginehouses fired up to prevent freezing.

Maintenance Standards Kept High—Lubrication

A high standard of maintenance and consequently high mileage per engine failure is responsible in no small measure for the success of the Burlington in inaugurating long engine runs. The present excellent condition of Burlington locomotives engaged in running over two or more divisions has been brought about by tightening up in the work of inspection, and making minor repairs

the grates by a light shaking, thus keeping the fires at the proper thickness. This feature, in conjunction with the 55 per cent air opening, practically prevented clinker formation with any of the coals burned. The grates proved popular with the crews owing to the ease of shaking which also encouraged firemen to shake the grates frequently and keep the fires in good condition.

The possibilities in the way of long fire life were indicated by two tests conducted in the latter part of 1923, in one of which Engine 2850 made 1,492 miles before the fire was knocked, the life of this fire being 121 hours. In the other case Engine 2855 made 2,645 miles with a single

TABLE IV.—SUMMARY OF SAVINGS EFFECTED BY LONG RUNS (LINES WEST.)

Passenger Service.				Engines Released For Other Service
Train Numbers	Terminals Between	Force Reductions	Fuel Savings	
3-5-9-15-17	Lincoln & Denver.....	\$706	\$367	7-Pacific type, C. B. & Q., Class S-2
2-6-14-16-22	Wymore & Denver.....	120	235	1-Pacific type, C. B. & Q., Class S-1
29-30	Denver & Casper.....	440	270	3-1 Pacific type, C. B. & Q., Cl. S-2
41-42-43-44	Casper & Billings.....			2 Mountain type, C. B. & Q., Cl. B-1
	Alliance & Sheridan.....			
Total		\$1,265	\$872	11 Engines
Freight Service.				Engines Released For Other Service
Pool	Terminals Between	Force Reductions	Fuel Savings	
	Alliance & Ravenna	\$1,276	\$123	2-Mikado type, C. B. & Q., Cl. O-1-A
Total		\$1,276	\$123	2
Grand Total Savings (Lines West)—\$3,537 per Month.				
Total Engines Released (Lines West)—13 Engines.				

promptly before defects have time to develop and possibly cause failures. Another contributing factor is the general improvement program carried out at the various shops on the system whereby locomotive parts such as frames which have shown themselves to be weak and a frequent sources of failure have been strengthened by putting in heavier sections. Old type cylinders subject to breakage between the valve chambers and frames have been replaced by improved modern designs.

The question of proper lubrication is important to the success of long engine runs and the way in which this is handled on the Burlington may be illustrated by the practice on locomotives running between Chicago and St. Paul, Minn. Three-pint lubricators are used on most of the locomotives in question and when they leave the Chicago terminal the lubricator is full and the engineman has 4½ pints in the tallow pot in addition. At Savanna, Ill., a service man meets the locomotive at the station and fills the lubricator, also the side and main rod grease cups. The same operation is repeated at Grand Crossing, Wis. Six pints of black or engine oil is provided. On the run from Chicago to Creston, Iowa, the lubricators are refilled at Burlington, Iowa. On this run the engineman starts out with five pints of valve oil in addition to the three pints in the lubricator. He is furnished with eight pints of black or engine oil.

Hulson Grates Aid Long

Runs; Now Standard on System

Approximately 40 per cent of the locomotives used in long runs on the Burlington are equipped with Hulson grates which are now the system standard and which are being applied to the balance of the power as rapidly as practicable. Both trial and service tests of these grates showed that they aid materially in enabling coal-burning locomotives to run past intermediate terminals where the locomotives formerly stopped to receive enginehouse attention, including new fires. On account of the rocking feature of these grates* experience showed that the fires were not broken up in shaking and in fact it was possible to remove just the right amount of ash from the bottom of

fire, the life of which was 183 hours. The following is a detailed report of the performance of these two engines during the periods referred to:

LIFE OF FIRE ON ENGINE 2850—EQUIPPED WITH HULSON GRATES

Engine out of shops, West Burlington, Iowa.....	October 17
Fired up at Burlington enginehouse, at 10 a. m.....	October 18
Trial run to New London and return (total 50 miles).....	October 19
(Fire not cleaned)	
Called for No. 4 at 11 p. m.....	October 19
Arrived at Chicago at 6:37 a. m.....	October 20
(Ash pan cleaned; fire not cleaned)	
Called for No. 11 at 11 a. m.....	October 20
Arrived at Burlington at 6:40 p. m.....	October 20
(Ash pan cleaned; fire not cleaned)	
Called for No. 4 at 11 p. m.....	October 20
Arrived at Chicago 6:37 a. m.....	October 21
(Ash pan cleaned; fire not cleaned)	
Called for No. 11 at 11 a. m.....	October 21
Arrived at Burlington at 6:40 p. m.....	October 21
(Ash pan cleaned; fire not cleaned)	
Called for No. 4 at 11 p. m.....	October 21
Arrived at Chicago at 6:37 a. m.....	October 22
(Ash pan cleaned; fire not cleaned)	
Called for No. 11 at 11 a. m.....	October 22
Arrived at Burlington at 6:40 p. m.....	October 22
(Ash pan cleaned; fire not cleaned)	
Called for No. 4 at 11 p. m.....	October 22
Arrived at Chicago at 6:37 a. m.....	October 23
Called for No. 11 at 11 a. m.....	October 23
On despatcher's order, held for No. 49.....	October 23
Fire knocked for boiler washout.....	October 23
Engine on and off clinker pit in 4 min.....	57 hr., 40 min.
Total running time.....	63 hr., 20 min.
Total enginehouse time.....	121 hr.
Total life of fire.....	1,492
Total mileage.....	

LIFE OF FIRE ON ENGINE 2855—EQUIPPED WITH HULSON GRATES

Called for No. 71, Burlington, Iowa, to Ottumwa, at 5:15 p. m.....	November 20
(74 miles, 25 cars, 1,200 tons)	
Arrived at Ottumwa, at 8:45 p. m.....	November 20
(Ash pan cleaned; fire not cleaned)	
Called for No. 76, at 10:45 a. m.....	November 21
(74 miles, 31 cars, 960 tons)	
Arrived at Burlington at 3:10 p. m.....	November 21
(Ash pan cleaned; fire not cleaned)	
Called for No. 7, Burlington, Iowa, to Creston, at 6:55 a. m.....	November 22
(188 miles, 6 cars of mail)	
Arrived at Creston at 11:30 a. m.....	November 22
(Ash pan cleaned; fire not cleaned)	
Called for No. 4 at 2:40 p. m.....	November 22

*See the *Railway Age* for February 4, 1921, page 339.

(188 miles, 9 passenger cars)		
Arrived at Burlington at 9:30 p. m.	November 22	
(Ash pan cleaned; fire not cleaned)		
Called for No. 7 at 6:55 a. m.	November 23	
Arrived at Creston at 11:30 a. m.	November 23	
(Ash pan cleaned; fire not cleaned)		
Called for No. 4 at 2:40 p. m.	November 23	
Arrived at Burlington at 9:30 p. m.	November 23	
(Ash pan cleaned; fire not cleaned)		
Called for No. 7 at 6:55 a. m.	November 24	
Arrived at Creston at 11:30 a. m.	November 24	
(Ash pan cleaned; fire not cleaned)		
Called for No. 4 at 2:40 p. m.	November 24	
Arrived at Burlington at 9:30 p. m.	November 24	
(Ash pan cleaned; fire not cleaned)		
Called for No. 7 at 6:55 a. m.	November 25	
Arrived at Creston at 11:30 a. m.	November 25	
(Ash pan cleaned; fire not cleaned)		
Called for No. 4 at 2:40 p. m.	November 25	
Arrived at Burlington at 9:30 p. m.	November 25	
(Ash pan cleaned; fire not cleaned)		
Called for No. 18, Burlington to Chicago, at 9:10 a. m.	November 26	
Arrived at Chicago at 2:40 p. m.	November 26	
Called for No. 15, Chicago to Creston, at 9 p. m.	November 26	
Arrived at Creston at 5:40 a. m.	November 27	
(Ash pan cleaned; fire not cleaned)		
Called for No. 4 at 2:40 p. m.	November 27	
Arrived at Burlington at 9:30 p. m.	November 27	
(Ash pan cleaned; fire not cleaned)		
Called for No. 12 at 3:05 a. m.	November 28	
Arrived at Chicago at 9 a. m.	November 28	
Engine held for washout.	November 28	
Fire was knocked in 10 min.	November 28	
Total running time.	80 hr. and 30 min.	
Total enginehouse time.	102 hr. 30 min.	
Total life of fire.	183 hr. 45 min.	
Total mileage.	2,645	

In the test of Engine 2855, it performed a variety of service, handling passenger, mail and freight trains between Chicago, Burlington and Creston, Iowa. The fire was finally knocked after 2,645 miles to permit a thorough boiler washout. The life of the fire was 183 hr., 45 min., and it was the consensus of opinion that it could have continued indefinitely, burning the average run of coal on these divisions. There was a saving of the knocking and

TABLE V.—INCREASE IN DAILY MILEAGE OF PASSENGER LOCOMOTIVES

Division	Train numbers	Daily train miles	No. of engines now used	No. of engines formerly used
Alliance-Sheridan	41-42-43-44	1,332	6	8
Denver-Billings	29-30	1,344	5	7
St. Louis-Galesburg	47-48-51-52	832	4	7
Nebraska District	(3-5-9-2-6-22) (15-17-14-16)	4,189	18	25
Galesburg-Kansas City	55-56	650	2	3
Hannibal-St. Joseph	14-15-16-17	824	3	4
Omaha-Kansas City	20-21-22-23	780	4	5
Chicago-St. Paul	47-48-49-50-51-52	2,586	7	9
Lincoln-Burlington	2-3-5-6-9-12	2,070	9	13
		14,607	58	81

Former average daily locomotive mileage.	180
Present average daily locomotive mileage.	252
Miles per day increase	72
Percentage increase	40
Locomotives released to other service.	23

building of 12 fires. Successful test runs of a similar character were made on the Brookfield division where the water is bad and locomotives must be held for a washout every 400 miles.

From an examination of this record it will be evident that Engine 2850 made seven trips in regular passenger service between Chicago and Burlington, Iowa, with a single fire, and then the fire was knocked because the locomotive was scheduled to take No. 49 into a bad water district making it necessary to wash out the boiler. In connection with the ratio of running to enginehouse time, it is interesting to note that Engine 2850 was in service 47.5 per cent of the time, which is considerably better than the national average of 33 1/3 per cent.

No firing tool was used on Engine 2850 during the runs, the fire being kept clean by shaking the grates

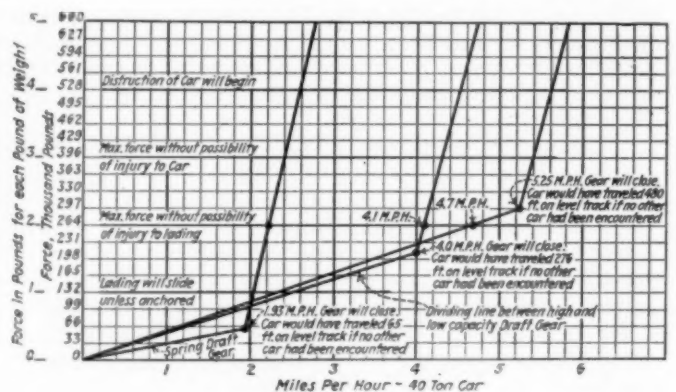
lightly. On arrival at a terminal the fire was shaken and enough coal added to keep it in shape while in the enginehouse. There was no formation of clinkers and the thickness of the fire at the end of the run is indicated by the fact that only four minutes were required on the cinder pit.

The grates were shaken four or five times on each trip and at no time were they difficult to shake.

The coal varied from good to dirty mine-run, from Southern Illinois. This test indicated the better combustion obtained with the 55 per cent air opening, and that the grates can be shaken lightly under a thin fire without disturbing the fire bed. The fine ash, being sifted from underneath the fire as it formed, resulted in a clean fire at practically all times.

Chart Shows Damage Due to Impact Between Cars

THE Freight Claim division of the American Railway Association has compiled a chart showing the impact between cars during switching with each of three types of draft gear, spring, low capacity friction and high capacity friction; a graphic record which enables one to compare the result of over-speed impact on cars equipped with these three types of gear. In addition, the forces exerted at different speeds and the effects of such forces on the lading, with each class of draft gear, have been estimated. These indicate the point at which lad-



ing will slide unless anchored by bracing and blocking; the estimated maximum force without injury to lading; the maximum force without injury to car; and the point where the destruction of the car will begin. The lines representing the force-velocity relations, for speeds above that which will close the draft gears, are based on calculations made from data derived from the draft gear tests of the United States Railroad Administration at Rochester, N. Y., in 1918.

THE RIGHT OF A ROAD IMPROVEMENT DISTRICT to include the right-of-way of a railroad as part of its operative property in assessments levied by the district for improvement purposes was upheld by Attorney General Webb of California in an opinion recently given. The opinion was an answer to an inquiry whether the right-of-way of a railroad is exempt from such assessments while other operative property, such as station grounds, is not exempt. The opinion takes issue with the contention of the Southern Pacific that right-of-way should be exempted, in spite of the assessment of station grounds, since there is a distinction between the different kinds of operative property.

Pennsylvania Follows Broad Plan in Stores Department*

A discussion of the organization, its responsibilities, its methods and the results attained

By C. D. Young

Stores Manager, Pennsylvania System, Philadelphia, Pa.

IN order that some general idea of the requirements of the supply service on the Pennsylvania may be had, it is necessary to present some statistical information regarding the road. The Pennsylvania System comprises 26,574 miles of track. It handles in a year 144,800,000 passengers and 215,400,000 tons of freight, or 4,900,000,000 passenger-miles and 41,700,000,000 ton-miles, with an equipment of 7,465 locomotives, 263,687 freight cars, and 6,786 passenger cars. The line traverses 13 states and the District of Columbia, through territory comprising almost half of the nation's population and probably three-quarters of the national wealth, handling about 12 per cent of the freight business and about 17 per cent of the passenger business of the country. It not only acts as a through carrier for connecting areas but originates an enormous tonnage—mostly the products of mines and mills. The total value of materials and supplies averages more than \$160,000,000 a year.

To meet the supply situation for the maintenance of this property, it is necessary to have a large number of storehouses located along the line from which supplies may be ordered and distributed to less important consuming points. These storehouses are separated from the central control office at Philadelphia by the limits of the system's operations. It is evident, therefore, that the control from the central office cannot be continuous in the sense that it would be if the stocks were concentrated near the central office.

Most of the Material Is Obtained on Its Own Lines

One feature governing the location and size of the ordering and distributing centers on this railroad is that most of the materials purchased are produced and obtained on its own lines and at points comparatively close to the distributing centers. This is quite unlike the store problem of a great many of the roads where materials are not manufactured in the territory through which the railroads operate. The supplies for these roads move to them through one or two important gateways where the control and distribution can be readily effected at strategic points.

With this background, it is interesting to know that we have 30 ordering and distributing storekeepers whom we term "Ordering" or "Reporting Storekeepers." They in turn have certain areas assigned to them in which they are the control agents, subject only to the general instructions from the general storekeeper from whom they obtain the final authority for ordering material.

These ordering or reporting storekeepers are virtually assistants to the general storekeepers in the distribution of materials within the area assigned them. To illustrate: the reporting storekeeper at the Trenton, N. J., shops is the control agent and the distributing center for all of the sub-stores and small working stocks at enginehouses

and outlying car repair points, and the distributed stock of maintenance-of-way material for the New Jersey Division and territory north of Philadelphia, although within that territory there may be other reporting storekeepers for specific items of material the requirements of which are greater than at Trenton. The basis for the selection of these stores is to provide a control of a given item of material to that storekeeper who has the greatly monthly requirements, plus an arbitrary centralization of maintenance-of-way material for the protection and replenishment of the requirements along the right-of-way within his area. These central maintenance-of-way depots are established at advantageous points where distribution can be readily effected without undue backhaul.

Purpose of the Stores Department

In the solving of any problem, it is frequently helpful to review the problem itself by taking note of the essential features of the question. Broadly stated, the prerequisites of an effective material control resolve themselves into having on hand at the right time, the right materials in such quantities as will satisfactorily serve the users, and at the lowest cost consistent with the quality desired. Let me stress, therefore, that the underlying principle of material control is to have at the right place at the right time the proper quantity of material consistent with the lowest possible total inventory, to meet the needs and *not the desires* of the user. The control of quantity is the most subtle and difficult thing to do, requiring as it does a well developed knowledge of the art of providing a stock of supplies, and knowledge of the course of events, all largely based upon the past, rather than the guesses of the future. It requires a knowledge of the history of the art and practices upon the road that the stores manager is attempting to serve.

This control should be carried on at the least expenditure of money in forces required for the ordering and distribution of material, and the transportation necessary to move the material to its ultimate point of use. Other important and closely related functions of effective material control (and these are functions which, without a separate departmental organization, are most difficult to accomplish) are the simplification of the different kinds, sizes and grades of material in order to reduce to a minimum the number of stock items; the proper receiving; the storage and definite location of each of these items; the control of issue; inventory and material accounting under the instructions of those responsible for accounting methods; and persistent and intelligent supervision of all other functions in the handling of material from the time of ordering until it is used and proper accounting performed.

Thus we find the problem of effective material control a most involved subject, which is rendered still more difficult on a large railroad system by the wide dissem-

* Abstract of a paper presented before the New England Railroad Club on April 14, 1925.

ination of the forces carrying on the work. There are further ramifications of this subject that should be appreciated before a complete picture of the problem can be had.

Material Comes From Three Sources

The material acquired on any railroad comes from three main sources: first, by purchase, which represents with us about 66 per cent of the total receipts; second, by manufacture, wherein raw or semi-finished materials have labor applied to make them available for final issue. This process adds a manufacturing cost representing about 12 per cent of the total receipts; and third, an entirely different operation from that of the average manufacturer, by the recovery or reclamation of what would otherwise be scrap. This reclamation, which represents 22 per cent of the total receipts, is done in two ways: First, by the inspection and acceptance of material fit for use, and second, by the conversion of material by the application of labor.

Under the first and most important of these captions, namely, "By Purchase," we find the major avenue of control, because through the purchasing of material, not only is the finished article obtained but also the raw or semi-finished items. Experience has shown that carefully supervising the ordering of material, acquired by purchase, is the best means of keeping it in hand, thus controlling the total inventory, although it is almost as important to safeguard the issuing of shop orders for the manufacture of material to the end that only those quantities will be manufactured that will be consumed currently.

The Pennsylvania System in order to meet this problem has departmentalized the purchasing and stores so that the material required would be under effective direct control.

System Is Organized to Secure

Effective Control of Materials

The organization at the present time, to administer the functions of control, consists of two general storekeepers and their necessary assistants under a stores manager who is charged with the control of all materials and supplies. One of the general storekeepers is located at Philadelphia and handles the requisitions and orders for material acquired through purchase. The other general storekeeper is located at Altoona, the largest of the road's production plants, and, I believe, the largest railroad shops in the world, for the control of those items of material which are normally obtained through manufacture. These two general storekeepers have entire charge of the ordering by requisition of all materials necessary for all departments. Their duties are briefly defined by quoting in part from the by-laws and organization for conducting the business of the company as follows:

"1. The general storekeeper at Philadelphia shall be responsible for all materials and supplies, except those manufactured at the company's shops for which the general storekeeper at Altoona shall be responsible.

"2. It shall be the duty of the general storekeepers to have materials at the time and place wanted and to see that the total quantity of material is kept at the minimum consistent with requirements and with methods necessary for economical production. They shall have authority to transfer materials and supplies. They shall report all materials for sale to the purchasing department."

In addition to the general storekeepers, the stores manager has a force of general material supervisors who police the local situations in assigned areas, or are specialists on particular commodities and problems for the purpose of maintaining that degree of control and execution of instructions that is necessary in any large organization.

These general material supervisors have the authority of the stores manager to correct any practices which are not in accordance with instructions. They are the eyes of the stores manager. They indicate to him wherein the machinery of organization is ineffective to meet situations and conditions which may be sources of ultimate serious disturbance in the routine and uniform service to the users of material.

This is a unique organization, so far as railroads are concerned, although it is closely related to what is known as "traveling storekeepers" on many lines. A little amplification of the duties of these men may be of interest. There are 15 supervisors assigned to geographical areas and they are responsible for the entire performance of all the stores department employees. They have no office and they have no office force, but are constantly on the move and in the most intimate contact with the users of material in the area assigned to them. This permits them to make the service as effective as possible and at the same time to see that the control of material is being carried out consistently with the policy of the management.

In addition to these locally assigned men there is a special group of supervisors, the nature of whose work is the supervision of some special or research work. For instance; one is charged with the responsibility of following up the proper handling of all waste material such as scrap, waste paper, materials left over from unusual operations and any items which may be successfully reclaimed. In addition he follows up the complaints on the sales of scrap when the buyer is not satisfied that shipment was made in accordance with the advertised classification.

Another specializes in the control of line stock not directly under the immediate jurisdiction of the stores department, i. e., material that has been issued but not used. Another works on the problem of distribution by supply car, supply train, local freight, motor cars and the arrangement of sailing dates for supply cars, and co-ordinates shipments that the maximum tonnage of company material shall move outside of the current commercial business with the least cost in transportation. Another specializes on the paper work, it being his duty to visit storehouses and make helpful suggestions for eliminating unnecessary clerical work. Another is a specialist in the storing and binning of material to the end that every item is so stored as to be readily counted, and, most important of all, its location known. Another is a specialist in seeing that the comptroller's instructions for accounting of material are carried out with the least clerical work. Another has the assigned duty of watching frozen items of material, namely, items acquired for certain projects which were later abandoned, to liquidate such items, offering them as substitutes to the end that frozen items either become assets or may be advantageously disposed of by sale. These men require a thorough knowledge of the business plus tact and diplomacy, without which they would be useless to the organization.

Magnitude of Work Requires a Catalog Bureau

Experience over a period of years has indicated that to carry on a work of this magnitude, every item of stock material for which the stores department is responsible shall have a definite designation and this is accomplished through a catalog bureau. It is the function of this bureau to analyze all standard drawings, letters of general practice, etc., of the engineering departments, cataloging from these drawings or letters, the material permitted for use. To each of these standard items a stock number is assigned, known as a "reference number," with the proper description, the unit in which the material should

be ordered such as "each," "pound," "feet," or liquid measure, and the standard minimum quantity to be ordered, eliminating the breaking of any manufacturer's standard packages.

This catalog bureau, in addition to following up the issues of instructions by the engineering departments, corrects, reissues and distributes this information to all concerned from one central office. Thus a standard item of material known by a reference number can, by a single printing, eliminate much paper work such as writing the descriptions on requisitions, stock cards, bin labels, inventory cards, etc., as they are all printed from one plate. This avoids those errors that often occur through transcription.

To give you some idea of the output of this bureau, in the year 1924 the following forms were printed:

1,452,000	Stickers for corrections to catalog.
6,620,000	Stickers for corrections to stock records.
169,000	Reissued catalog pages.
4,402,000	Stock bin labels.
247,000	Stock record cards.
32,000	Stock replenishment cards.
542,000	Inventory cards.
244,000	Master stock book sheets.
99,000	Visible index price cards.
27,000	Stock order sheets.
59,000	Requisitions.
17,000	Transfer orders.

In addition to this work performed for the stores department, this bureau furnished the following stationery for other departments:

142,000	Locomotive staybolt test forms.
123,000	Freight department forms.
40,000	Addressograph plates for payroll and other work.

Personnel and Positions

It is an old axiom that a fairly poor plan well executed will bring better results than a most excellent or elaborate plan the execution of which is faulty. Therefore, the personnel to carry out our organization plan is of interest. It is to this personnel that we look for effective control of the supply for the railroad.

The general storekeepers are men who have had experience in the use of material. They were trained in the operation of the road and acquired a position of importance as users of material, and their decisions in their present positions are respected by those now requiring material. They are thoroughly familiar with the users' viewpoint and have the ability to differentiate between the essentials and non-essentials of an efficient supply service. The storekeepers are under the direct supervision of the general storekeepers, who are assisted by the co-operation of the officers of other departments responsible for the use of material through the provisions of the organization which requires that division engineers and master mechanics shall obey the instructions of the stores manager in all matters relating to materials and supplies.

Means of Control

The stores manager is the control agent. His means of control is through the general storekeepers. He provides them with a monthly budget showing the total amount of money chargeable to operating expenditures, and with this budget as a basis, establishes and provides his general storekeepers with a limited figure which they may not exceed in the value of purchased or manufactured material for stock unless unforeseen conditions necessitate special authority for change. Thus the total inventory moves in accordance with a prearranged schedule. In addition his department is advised by those responsible for construction work, of the rate at which they expect to expend their authorizations in order that the delivery of material may be regulated in accordance with a prearranged program. In this way materials are received on the job as actually needed without undue stocks being received a long time in advance of their application.

The general storekeeper who is in charge of all items of purchased material, receives from each of the ordering or reporting storekeepers, a stock report on which is given the reference number of the item, the quantity on hand, the quantity due on existing orders, the quantity consumed in the last 30 days and the quantity of new supply which he desires placed on order for his point. These small stock reports, about the size of a bond coupon, are pasted in a clearing record book, and if the quantity the reporting storekeeper desires ordered seems proper, a combined requisition for the entire system of each item is prepared by the general storekeeper and forwarded to the purchasing agent, who buys the quantity required. Delivery is arranged in accordance with the requirements of each reporting storekeeper.

If, in the general storekeeper's judgment, the total quantity desired is in excess or is insufficient for the requirements, he reduces or increases the quantity and the reporting storekeeper is advised of such changes. If the reporting storekeeper has knowledge of a situation requiring the original quantity, he must react against the general storekeeper's judgment and tell him why he requires such a quantity and the general storekeeper, upon conviction of its necessity will reinstate the original figures. Thus it is seen that the control for each item of material for the entire system is in the office of the general storekeeper, whereas the initial desire for such quantities is purely a local matter with each reporting storekeeper, and centralized control with decentralized operation permits the full exercise of local initiative by the storekeeper.

If at one storehouse an item of material is required and that same item of material is moving slowly or not at all at another storehouse, the transfer of a needed quantity is arranged by the general storekeeper before the preparation of a requisition, thus liquidating slow-moving or inactive material and reducing the total quantity on hand for the system. Thus there is an immediate shifting of material as soon as it becomes inactive at one locality and is made active by moving it to a locality where it will be used.

The general storekeeper at Altoona, who is in charge of the control of manufactured material, conducts his business in a manner similar to that of the general storekeeper in charge of purchased material, by the receipt of stock reports for the desired quantities of manufactured material. He then prepares manufacturing shop orders and forwards to such shops as are equipped to economically produce such material or liquidates slow moving or inactive stocks of manufactured material by transfer in order that only the total quantity will be ordered.

Estimating the Proper Quantities to Order

How do the general storekeepers know the proper quantities of material to order? This is arrived at by an empirical formula in which the following factors are used to arrive at the total quantity to be ordered: First, the minimum quantity which should be on hand at time of receipt of new supply; and second, the time required from the time the ordered is placed on the purchasing department until delivery can be expected at the storehouses. These two factors multiplied by the past consumption for either 30 days, three months or the previous season's consumption, less the quantity on hand and due on orders, establishes the quantity which the general storekeepers should order to maintain a continuous supply on the system to meet the requirements of the service.

A different value for the first factor is established for certain items of material, and these items, depending upon their relative importance, are placed in four general classes. The first class is given the highest total quantity which

should be on hand at all times and consists of material vital to the operation of the railroad, such as torpedoes, fuses, material protecting signal aspects, etc. In the standard stock book, containing upwards of 75,000 items, the total number in this class is less than 200. By this means there is always sufficient reserve stock to meet any sudden change in consumption conditions. The second class, in which this factor is slightly reduced, are those items of material important to maintenance, the shortage of which would seriously inconvenience the continuous operation of the service. The third class, constituting over 90 per cent of the total number carried in stock, is that in which the minimum quantity to be on hand at time of receipt of new supply, is reduced to not more than 15 days' supply. The fourth class is made of those items which are unimportant to continuous operation and the actual exhaustion of this stock is not of any serious consequence.

Thus, by the arrangement of an arbitrary formula applied to classes of material of different importance, a central force may readily control the total stock of each of the items in the proper quantity necessary for the essential operations and maintenance.

Results of One Year's Operation

No doubt it will be of interest to know what such a departmental arrangement on a large system has accomplished. The stores department, as outlined, was organized in January, 1924, and in the period of 12 months following, the total inventory was reduced from \$87,500,000 to \$64,700,000. Of course this reduction was not due entirely to the change in the organization, but to other causes, yet over 80 per cent of the reduction was effected through the activity of the stores department and the regulations it effected in the using departments. What may yet be accomplished will be largely due to the machinery set up for systematic control with the further co-operative support of other departments.

The Bureau of Valuation of the Interstate Commerce Commission prepared and recommended to the commission, as stated in their "Memorandum of the Amount of Working Capital Needed by Railways," dated October 13, 1922, a formula providing that the materials and supplies balance of railroads should represent about 10 per cent of their annual operating expenses. This is based upon an analysis of the figures of Class 1 and 2 roads and combined for the years 1914, 1915 and 1916. This analysis developed the fact that material balances during that period averaged 12.60 per cent of the annual operating expenses. It stated, that as material balances are drawn upon, to some extent, for additions and betterments, they generally include material consigned for specific betterments not yet in place; and also generally include more or less obsolete or scrap material which has not been written down to a proper value based upon its actual usefulness. It was considered that 10 per cent of the annual operating expenses was about what the investment in materials and supplies should be.

In this connection I wish to state emphatically that in my opinion this is not the correct method of comparing two operations of this work. The best measure of comparison obtainable is the actual turnover, which figures must be weighed and considered carefully in comparing roads or groups of railroad lines. However, as it is interesting to make comparisons, I have compiled for 1923, the latest information obtainable of the gross revenue, expenses and material balances of the roads comprising the New England Region. With this information, I find that material balances as of December 31, 1923, represented 11.11 per cent of their 1923 operating revenue and 13.33 per cent of their operating expenses of

that year. The same comparison for the Pennsylvania System as of December 31, 1924, shows material balance to be 9.69 per cent of the 1924 operating revenue and 12.07 per cent of the operating expenses.

It would seem that if 10 per cent of the annual operating expenses is to be the final decision of the commission as a measure of our material inventories, some of the roads which do not measure up to this standard should give serious consideration to the problem of supplies in order to come within the specified requirement. A "house well in order" need not contemplate with great concern a requirement within its performance.

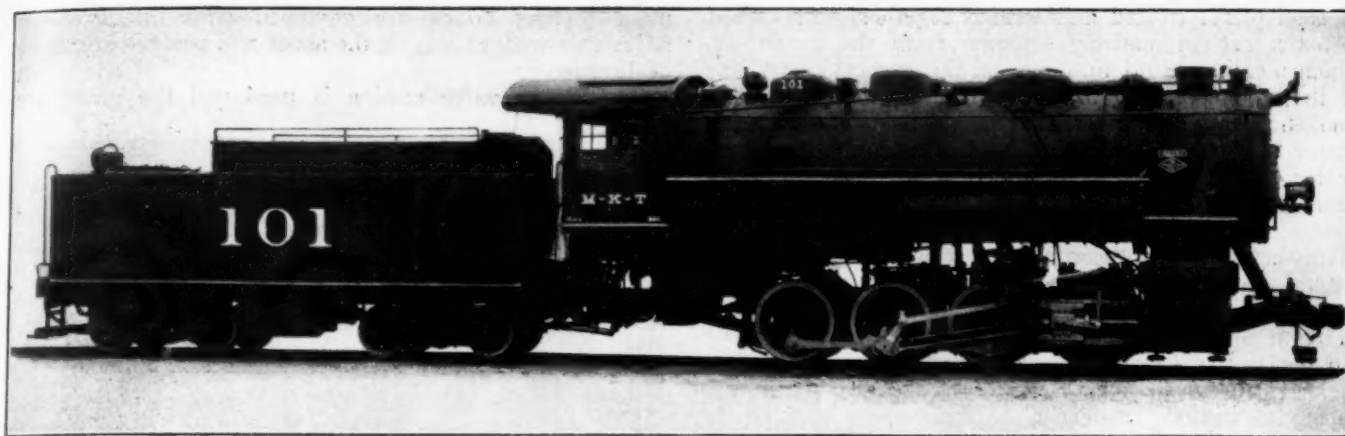
Conclusions

Too little time has elapsed for anyone to judge the final plan which will be carried out in service of supply. As times change, plans change, but as far as we have gone, there is every indication that the arrangement we have provided for effective stores control is a simple, workable and efficient scheme. A good test of the plan is the frank statement of the users of material that the service thus far is more than reasonably satisfactory from their point of view. Certainly it is admitted by those whom we serve that it has approached its primary objective, namely, effective control, and within a reasonable degree, material is being supplied at the right time in accordance with current needs. If a reasonable control of inventory is to be expected in any large business, affected as it is by fluctuating conditions caused by good and bad times, a supply department becomes essential. The history of our country has indicated that most of the roads, and manufacturers as well, have found themselves with large stocks of materials when coming out of a prosperous period and the value of these stocks has been a great burden to them through the dull business period immediately following.

My experience, which covers various positions in the mechanical as well as the operating department, indicates that the primary function of effective control will not be obtained by leaving the entire question to the users of material. They cannot be consistent and at all times greatly concerned with the total value of stocks on hand. Their regular duties require too much of their attention to give the question of supply control the serious consideration that is necessary to secure efficient operation with a minimum of stock.

It is not sufficient to say "Yes, we have a stores department," but it is necessary to go further and to analyze the restrictive nature under which such a department is forced to function. If the users of material are dominating the final judgment of what shall be done, further control must be placed in the hands of the stores department and greater responsibility placed upon the person exercising that control if the railroads are to obtain the maximum in control and service.

A BULLETIN issued by A. W. Smallen, general supervisor of safety and fire prevention of the Chicago, Milwaukee & St. Paul, shows in graphic form the great decrease in the total number of employees, trespassers and others killed on the lines of the company in the last 12 years. With 1913 as a basis, in which year 423 employees, trespassers and others were killed, the chart shows that this number had been decreased 59.8 per cent in 1924, when only 170 were killed. The improvement which has been made is even more striking in the case of the employees alone. Thirty-seven employees were killed in 1924, a reduction of 74.8 per cent from the number, 147, killed in 1913. The bulletin also calls attention to the fact that not a passenger had been killed in a train accident on the Chicago, Milwaukee & St. Paul in the five years ending December 31, 1924.



Missouri-Kansas-Texas Eight Coupled Switcher with a Tractive Force of 60,000 lb.

Unique Front End Arrangement on Powerful M.-K.-T. Switcher

Dry pipe and branch pipes on outside of boiler—Smokebox airtight—Tractive force 60,000 lb.

WHEN considering the design of the eight-wheel switching locomotives shown in the illustrations, the motive power officers of the Missouri-Kansas-Texas departed somewhat from the standard

inside of the boiler and smokebox are placed in a position so that inspection or repairs can be quickly and easily made without entering the boiler or front end. Ten of these switchers were recently built by the Lima Locomotive Works, Lima, Ohio, and have been put in service, four at Parsons, Kans., and the remaining six at Denison, Tex.

These locomotives are among the heaviest eight-coupled switchers that have been built. A comparison between these locomotives and a few other heavy, eight-wheel switchers recently built for other roads is given in the table below.

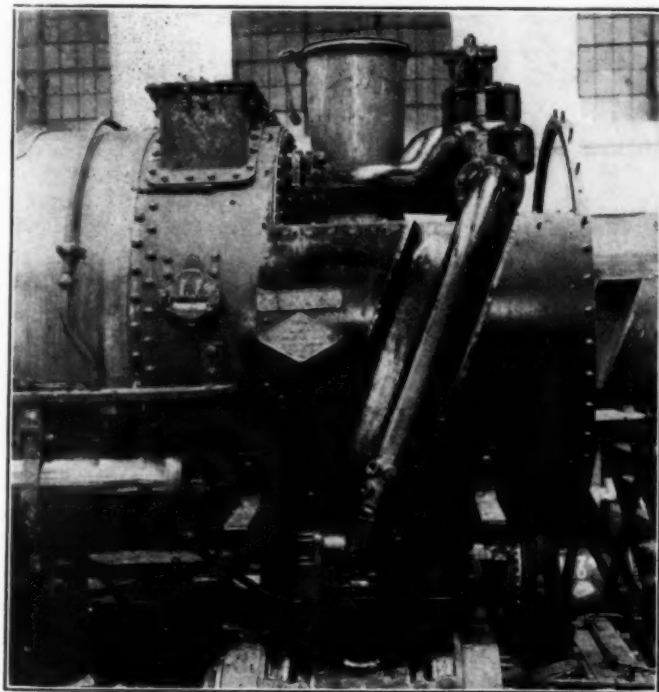
Road	Weight, lb.	Rated tractive force, lb.	Cylinders, in.	Drivers, in.	Steam pressure, lb.
M. K. T.....	244,000	60,000	26 by 28	51	190
Belt. Ry. of Chicago.	241,600	60,000	27 by 30	57	185
R. F. & P.....	259,000	60,700	26 by 28	53	200
N. Y., N. H. & H..	245,500	60,600	3-22 by 28	57	200
C. R. R. of N. J....	238,500	53,400	24 by 30	55	200
U. S. R. A.....	214,000	51,200	25 by 28	51	175

The Boiler and Accessories

The boiler has a straight top with a wide firebox which is 102 $\frac{1}{8}$ in. long by 72 $\frac{1}{8}$ in. wide inside. This size firebox provides a grate area of 51.1 sq. ft. The first course of the boiler is 86 $\frac{3}{8}$ in. and the largest course, 87-15/16 in. in outside diameter. The firebox is radial stayed. There are 270, 2-in. tubes and 40, 5 $\frac{1}{2}$ -in. flues, 15 ft. long, which give a combined heating surface of 2,965 sq. ft. This heating surface, combined with 205 sq. ft. provided by the firebox and 725 sq. ft. of superheating surface, give a total of 3,995 sq. ft. The boiler pressure is 190 lb.

The dry pipe and the branch pipes to the cylinders have been placed on the outside of the boiler. This arrangement has been made possible by a modification of the Type A superheater header and the use of the Chambers front end throttle, and involves a unique design of the smokebox shell.

The front end is divided into two sections by a shelf



Application of the Front End Throttle with the Branch Pipes Outside of the Smoke Box

arrangement of the front end and created a design which has eliminated all possible openings into the smokebox through which air might enter and partially destroy the vacuum, and in which the various parts which are usually

of steel plates riveted and welded together. This shelf forms a section, entirely separate from the smokebox, which measures $26\frac{1}{4}$ in. down on the vertical center line of the smokebox and $57\frac{1}{4}$ in. from the outside of the smokebox ring to the vertical plate in front of the superheater header. Before this section is enclosed the superheater header, which is designed so that the dry pipe connection extends through the top of the smokebox wrapper sheet, is bolted in place on two brackets. The Chambers front end throttle, from which the branch pipes extend down on the outside of the smokebox, to the cylinders, is placed in the upper section of the front end, in front of the stack. The sheets of the smokebox are cut out and two formed pieces of boiler steel are electric welded in place to form the recesses in which the branch pipes are housed. Referring to the general view of the locomotive, it will be noticed that a jacket has been neatly bolted around the branch pipes which conforms in appearance to the conventional design, in which the branch pipes pass through the front end sheets to the steam



Recess for the Branch Pipe Welded in Place

chest. The fact that the branch pipes are on the outside of the boiler eliminates two openings into the smokebox, which in many cases have been found difficult to keep air-tight. A further advantage of this arrangement is that the superheater header and throttle valve may be easily inspected and repaired without disturbing the drafting arrangement in the smokebox.

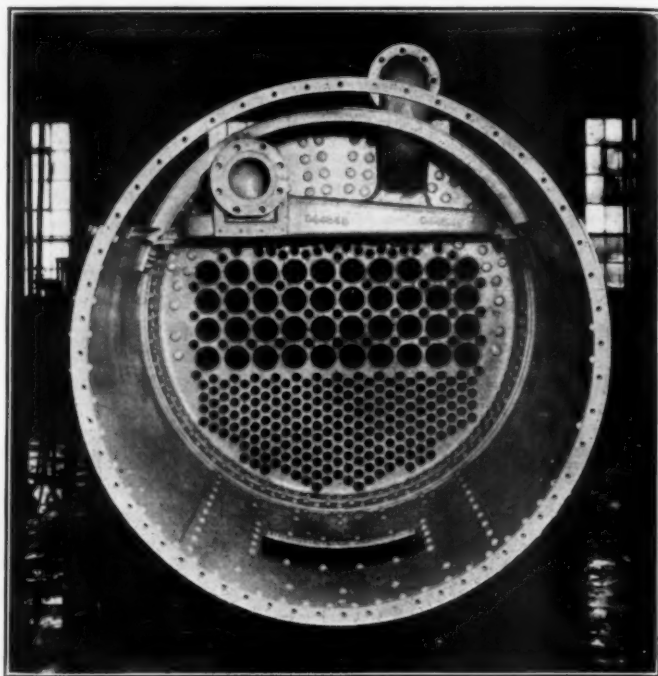
The locomotives are equipped with Hancock H. No. 2 injectors. Other boiler fittings include three Ashton $3\frac{1}{2}$ -in. safety valves, one muffled and two open; one Okadee blow-off cock and blower valve, and a Hancock water column. The firebox is equipped with a Booth oil burner, and the draft pan is of Commonwealth cast steel design.

Engine and Running Gear

The dimensions of the cylinders are 26 in. by 28 in. The cylinders and steam chest are fitted with Hunt-Spiller bushings, and this material is also used for the valve packing rings and the piston bull rings and packing rings. The piston heads are of rolled steel and the piston rods are of carbon vanadium steel, normalized. This material is also used for the main and side rods. The

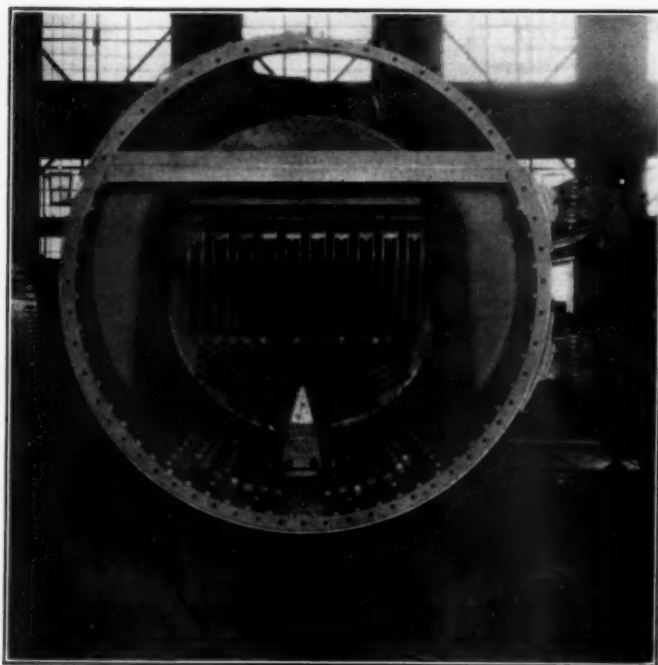
main driving boxes are equipped with the Franklin adjustable wedges and all the shoes and wedges are made of bronze.

The Baker valve motion is used and the gears are



Type A Superheater Header for Outside Dry Pipe and Front End Throttle in Place in the Smoke Box

controlled by the Type B Ragonnet screw reverse gear. The cylinders are lubricated by the Schlacks two-feed system. A Unit safety drawbar and wedge type radial buffer are used to connect the engine and tender. The



Front End with the Upper Portion Separated from the Smoke Box

draft gear is the Cardwell G-11-A, with the American Steel Foundries' coupler yoke attachment.

The air brake is the New York, No. 6-ET, with one

8½-in. cross-compound air compressor on the left-hand side of the boiler. The air, oil and steam connections are of the McLaughlin flexible type.

Tender

The tender is the U-shape, level top type, mounted on a Commonwealth cast steel frame and carried on two four-wheel arch bar trucks. The 33-in. wheels are of the Edgewater rolled steel type. Wood, three-tip roller bearings are used on the truck. The tank has a capacity of 8,000 gal. of water and 2,500 gal. of oil.

Further particulars of these locomotives are given in the accompanying table of dimensions, weights and proportions.

Railroad	Missouri-Kansas-Texas
Type of locomotive	0-8-0
Service	Switching
Cylinders, diameter and stroke	26 in. by 28 in.
Valve gear, type	Baker
Valves, piston type, size	12 in.
Weights in working order:	
On drivers	244,000 lb.
Total engine	244,000 lb.
Tender	160,000 lb.
Wheel bases:	
Driving	15 ft.
Total engine and tender	53 ft. 7½ in.
Wheels, diameter outside tires:	
Driving	51 in.
Boiler:	
Type	Straight top
Steam pressure	190 lb.
Fuel	Oil
Diameter, first ring, outside	85½ in.
Firebox, length and width	102¼ in. by 72¼ in.
Flues, number and diameter	270, 2 in.
Flues, number and diameter	40, 5½ in.
Tubes and flues, length	15 ft.
Grate area	51.1 sq. ft.
Heating surfaces:	
Firebox	205 sq. ft.
Tubes and flues	2,965 sq. ft.
Total evaporative	3,170 sq. ft.
Superheating	725 sq. ft.
Comb. evaporative and superheating	3,995 sq. ft.
Tender:	
Style	U-shape
Water capacity	8,000 gal.
Fuel capacity	Oil—2,500 gal.
Trucks	Four-wheel arch bar
General data, estimated:	
Rated tractive force, 85 per cent	60,000 lb.
Cylinder horsepower (Cole)	2,312 hp.
Weight proportions:	
Weight on drivers ÷ tractive force	4.07
Total weight engine ÷ cylinder hp.	105.5
Total weight engine ÷ comb. heating surface ..	61

Hearing on Nickel Plate

WASHINGTON, D. C.

HEARINGS on the Van Sweringen proposal for unified control and operation of the New York, Chicago & St. Louis; Chesapeake & Ohio; Hocking Valley; Erie, and Pere Marquette, were begun before Commissioner Meyer and Director Mahaffie of the Bureau of Finance of the Interstate Commerce Commission on April 15, after the commission had overruled a motion by representatives of minority stockholders of the Chesapeake & Ohio for an adjournment of the hearing pending a decision by the chancery court of the city of Richmond, Va., on their application for an injunction to prevent the lease of the C. & O. to the Nickel Plate.

The full membership of the commission, except Commissioner Woodlock, listened for an hour and a half to arguments on the motion, after which the decision to overrule it was promptly made and the hearing begun, with T. C. Powell, traffic vice-president of the Erie, as the first witness. There was a large attendance, including not only executives and experts of the roads involved in the proposed merger but also counsel and officers of other roads directly and indirectly interested and other persons especially interested in the whole consolidation question.

Arguments in favor of a postponement were made by Thomas F. Gay and Henry W. Anderson on the ground that the Chesapeake & Ohio, during the injunction pro-

ceedings before the Richmond court, had agreed not to effect the lease, even if authorized by the Interstate Commerce Commission, until the court has passed on the question of the powers of the company to make such a lease under its charter and the Virginia laws. It was contended that the court decision might render the proceedings before the commission moot and Mr. Gay took the position that the road had agreed not to make the lease unless approved by the court, although W. A. Colston, general counsel for the New York, Chicago & St. Louis, said the stipulation itself showed that this was not the case. Mr. Colston in his reply argument said that the case could not be rendered moot because even if the Virginia court should hold the transaction to be unlawful under state law a decision of the Interstate Commerce Commission, under the transportation act, could make it lawful. Also, he said the Virginia question does not effect the proceeding as to the other roads involved in the application for authority nor the application for authority to acquire control by stock ownership, and enough stock has been deposited to carry out the control even if a lease is never made.

Representatives of the Akron, Canton & Youngstown, Wheeling & Lake Erie, and minority stockholders of the New York, Chicago & St. Louis, were allowed to intervene in the case, in addition to those who had been allowed to intervene by previous orders of the commission, including the New York & Pennsylvania minority stockholders of the C. & O., and the American Short Line Railroad Association.

In opening the testimony Mr. Colston filed for the record copies of the resolutions of the stockholders of the various companies in favor of the plan and also letters written to the Interstate Commerce Commission by public authorities approving the application. These included expressions of approval or of no objection from the state commissions of Ohio, Virginia, Kentucky, New York, West Virginia and Wisconsin and also letters favoring the plan from Postmaster General New and Senator Watson of Indiana.

Mr. Powell read a long statement which he illustrated with various maps analyzing in detail the traffic effects of of the proposed unification on each road and on the industries served by the various lines. He said experience shows that no railroad can prosper on the business originating on its own rails alone and showed how the combination of these roads would tend to increase the volume and diversification of the traffic handled by them as well as to make available a large number of additional through routes with reduced mileage under a single management in place of routes now made up of several lines under separate managements. He said the proposed system would meet the competition of all three of the other trunk line systems, the Pennsylvania, New York Central and Baltimore & Ohio, at such places as St. Louis, East St. Louis, Chicago, Louisville, Cincinnati, Columbus, Toledo, Cleveland, Akron, Barberton, Youngstown, Jersey City and New York, and he named the points at which it would meet the competition of one or two of the other systems. This showed, he said, that the system would not have any monopoly and that it would preserve existing channels and routes of traffic by affording ample facilities for the interchange of traffic with connecting lines in all directions. He pointed out that whereas the Pennsylvania now serves 35 cities of a population of 75,000 or more, having a total population of over 19,000,000; the New York Central 30, with a total of over 17,000,000; the Baltimore & Ohio 19, with a total of over 17,000,000; the Nickel Plate system would serve 28 with a population of over 17,000,000.

Mr. Powell laid emphasis on the advantage to the

Chesapeake & Ohio and Hocking Valley from the increased number of outlets for the coal produced on their lines to result from the assistance of the other lines in the system, which originate very little coal, in developing additional markets, whereas they cannot now depend on the three other big systems for help where the coal produced on the latter comes into competition with the C. & O. coal. The C. & O., he said, in time could increase its coal loading 100 per cent and yet if the process of consolidation goes on it would soon be surrounded by large systems that have a large amount of coal of their own. The same facilities, he said, will assist in the distribution of other traffic by putting the lines on a parity at important gateways. Mr. Powell outlined the various routes which, while now available via several lines, are not developed because the interest of the single roads in them is so much less than would be that of a unified management, and the various connections available in all directions. He also discussed the traffic situation of each line to show how it would be improved by the combination and by the increased co-operation that would be afforded by lines that are now only connections. For example, he said the Erie now needs a greater proportion of westbound traffic, which it could get by reason of the new western outlets that would be afforded and that the unified system would provide additional routes for eastbound traffic which now sometimes congests the Erie line between Marion and Meadville. He said the Nickel Plate would be particularly valuable because it will open up new routes to the other lines which will tend to diversify their traffic. The movement of a larger volume of more diversified traffic, he said, would affect favorably the handling of export and import traffic, car supply, the loading of cars in return movement, the distribution of cost of terminal collection and delivery at the larger points, the development of freight and passenger terminals and the relations between the trunk lines and the short lines.

Mr. Powell was cross-examined by Henry W. Gay and Albert I. Stiles, on behalf of protesting minority stockholders of the Chesapeake & Ohio, who apparently tried to show that there is now competition between the Chesapeake & Ohio and the Nickel Plate and the Erie which would be reduced, that the various routes mentioned are available now without a lease, that in return for the advantages of closer relations with the other lines there would be the disadvantage of the loss of friendship of the New York Central, Pennsylvania and Baltimore & Ohio, and that it is proposed to lease the Chesapeake & Ohio to a system that will be the weakest of four large trunk line systems.

Rail Production Less in 1924 Than in 1923

THE production of rails in the United States, according to statistics of the American Iron and Steel Institute, declined to the amount of 471,184 gross tons during 1924 as compared with 1923. Last year the production totaled 2,433,332 tons, whereas the total in 1923 was 2,904,516 tons. However, the total for 1924 is considerably greater than for either 1921 or 1922. The range of rail production from 1908 to 1924, inclusive, is shown in the table below.

PRODUCTION OF RAILS BY PROCESSES, GROSS TONS, 1910-1924.

Years	Open-hearth	Bessemer	Rerolled*	Electric	Iron	Total
1910.....	1,751,359	1,884,442	.....	†	230	3,636,031
1911.....	1,676,923	1,053,420	91,751	462	234	3,822,790
1912.....	2,105,144	1,099,926	119,390	3,455	...	3,327,915

Years	Open-hearth	Bessemer	Rerolled*	Electric	Iron	Total
1913.....	2,527,710	817,591	155,043	2,436	...	3,502,780
1914.....	1,525,851	323,897	95,169	178	...	1,945,095
1915.....	1,775,168	326,952	102,083	...	...	2,204,203
1916.....	2,269,600	440,092	144,826	...	...	2,854,518
1917.....	2,292,197	533,325	118,639	...	...	2,944,161
1918.....	1,945,443	494,193	101,256	...	...	2,540,892
1919.....	1,893,256	214,121	96,422	50	...	2,203,843
1920.....	2,334,222	142,899	126,698	297	...	2,604,116
1921.....	2,027,215	55,559	96,039	5	...	2,178,818
1922.....	2,033,000	22,317	116,459	...	...	2,171,776
1923.....	2,738,779	25,877	139,742	118	...	2,904,516
1924.....	2,307,533	16,069	109,730	...	...	2,433,332

*Rerolled from old steel rails. Included with Bessemer and open-hearth steel rails in 1910. †Small tonnage rolled in 1910, but included with Bessemer and open-hearth rails for that year.

The above table shows also that the production of Bessemer rail during 1924 was less than for any previous year, namely, 16,069 tons, an amount which is so small as to be virtually negligible. The production of rails as given above includes in addition to new rails rolled, rails rolled from defective rails and old rails. The total of

PRODUCTION OF RENEWED AND REROLLED RAILS, 1916-1924.

Years	Open-hearth	Bessemer	Total	Rolled from old rails	Total rerolled
1916.....	1,711	2,149	3,860	144,826	148,686
1917.....	1,825	7,182	9,007	118,639	127,646
1918.....	13,296	19,462	32,758	101,256	134,014
1919.....	1,933	5,766	7,699	96,422	104,121
1920.....	19,493	1,979	21,472	126,698	148,170
1921.....	6,525	702	7,227	96,039	103,266
1922.....	996	...	996	116,459	117,455
1923.....	16,640	561	17,201	139,742	156,943
1924.....	11,325	453	11,778	109,730	121,508

renewed and rerolled rails so included is given in gross tons below.

During 1923 the production of rails weighing 100 lb. per yd. or over for the first time exceeded 1,000,000 tons, the total being 1,465,850 tons and representing 50.5

PRODUCTION OF RAILS, SHOWING DECREASE BY PROCESSES, GROSS TONS, 1923-1924.

Kinds	1923	Per cent	1924	Per cent	Decrease	Per cent
Open-hearth	2,738,779	94.29	2,307,533	94.83	431,246	15.75
Bessemer	25,877	0.89	16,069	0.66	9,808	37.90
All other	139,860	4.82	109,730	4.51	30,130	21.54
Total	2,904,516	100.00	2,433,332	100.00	471,184	16.22

per cent of the total tonnage. The record for 1924 falls considerably short of this total and amounted to 1,175,581 tons or 48.3 per cent of the total tonnage of all weights of rail. While the tonnage of rails weighing 85 lb. and less than 100 lb. per yd. rolled during 1924 was slightly

PRODUCTION OF RAILS BY WEIGHT PER YARD, 1908-1924

Years	Under 45 pounds	45 and less than 85	85 and less than 100	100 pounds and over	Total gross tons
1908.....	183,869	687,632	1,049,514	1,921,015	1,921,015
1909.....	255,726	1,024,856	1,743,263	3,023,845	3,023,845
1910.....	260,709	1,275,339	2,099,983	3,636,031	3,636,031
1911.....	218,758	1,067,696	1,536,336	2,822,790	2,822,790
1912.....	248,672	1,118,592	1,960,651	3,327,915	3,327,915
1913.....	*270,405	†967,313	2,265,062	3,502,780	3,502,780
1914.....	*238,423	†309,865	868,104	528,703	1,945,095
1915.....	*254,101	†518,291	742,816	688,995	2,204,203
1916.....	*295,535	†566,791	1,225,341	766,851	2,854,518
1917.....	*308,258	†882,673	989,704	763,526	2,944,161
1918.....	*395,124	†665,165	888,141	592,462	2,540,892
1919.....	*263,803	†495,577	965,571	478,892	2,203,843
1920.....	*489,043	†433,333	952,622	729,118	2,604,116
1921.....	*211,568	†214,936	902,748	849,566	2,178,818
1922.....	*265,541	†274,731	728,604	902,900	2,171,776
1923.....	*272,794	†300,907	864,965	1,465,850	2,904,516
1924.....	*191,046	†213,274	853,431	1,175,581	2,433,332

* Includes rails under 50 pounds. † Includes 50 pounds and less than 85 pounds.

less than for 1923, it actually represents a larger proportion of the year's tonnage than in the case of the year preceding. Rails of this weight represented 35.1 per cent of the total of 1924, as compared with 29.7 per cent in 1923.

Pennsylvania Protects Against Water Shortage at Altoona

Reservoir with capacity of 355 million gallons will nearly double capacity at road's largest terminal

By Charles Haydock

Formerly Engineer, P. R. R. Water Companies, Philadelphia, Pa.

THE recently completed Tipton dam near Altoona, Pa., is the most important improvement to the Pennsylvania's water supply system which has been made in the last 15 years. This dam was built by the Tipton Water Company, which is a subsidiary of the Pennsylvania.

The importance of this addition to the railroad water supply in the Altoona district is indicated by the fact

way. The drought of 1922 emphasized the need for a large storage dam and the project was revived and promptly authorized. As authorized, the work comprised a main storage dam on Tipton Run, a diverting dam on a smaller tributary called Loup Run, and a pipe line to divert the water from this into the main reservoir.

Impounds Mountain Water

Tipton Run is one of the purest mountain streams in the vicinity of Altoona. The company owns 8,000 acres of land, comprising most of the watershed of the stream, and the continued purity of the stream is therefore assured. The watershed is almost entirely covered by a young growth of forest trees. Tipton is about 10 miles east of Altoona and the dam is being constructed at a point approximately $3\frac{1}{2}$ miles up the valley from the main line of the railroad. The drainage area of Tipton Run at the site of the dam is 8.2 sq. mi., and of Loup Run at the site of the intake dam, 3.2 sq. mi., so that



The Dam was Faced with Stone Masonry and Backed with Cyclopean Concrete

that at the present time there are five reservoirs, holding 430 million gallons of water, while the new Tipton dam alone will store 355 million gallons of water, or 80 per cent of the present combined storage. As a result of this, the danger of a water shortage in the Altoona district will be greatly reduced in the future. With the new dam in service the total quantity of water stored in the district for railroad uses is 785 million gallons, or enough to last about 90 days without any water flowing into the reservoirs.

In 1903, there occurred one of the most severe droughts ever recorded in Pennsylvania. It was almost impossible to secure enough water to operate the railroad in the Altoona district, even though many water trains were run daily. As a result of this extreme water shortage, the rights of the Tipton Water Company were acquired and shortly after a small intake dam on Tipton Run and a 16-in. pipe line to Juniata were built. The construction of a large storage dam was contemplated at that time, but was later deferred, owing to the magnitude of other water supply improvements then under



Seepage Under the Dam was Prevented by Constructing a Cut-off Wall in a Trench and by Grouting

by means of this dam it will be possible to impound the water flowing from a total of 11.4 sq. mi.

The first step was to remove all the soil and loose rock from the site. The solid rock was then excavated for a depth of several feet in order to give a proper foundation in solid rock. A wide trench was excavated near the downstream face, and the main body of the dam was built into this trench or key. To reduce further the danger of leakage occurring under the dam, a cut-off trench 5 ft. wide and 15 ft. deep was excavated in the solid rock at the upstream toe. This was done by using a channeling machine to make a cut along the downstream face of the trench. After the channel was cut, holes were drilled a

few feet upstream and the rock blasted out in the ordinary manner. In this way the cut-off trench excavation was made without danger of opening up seams in the rock by the force of the blasting.

Preparing the Foundation

In order to start work on the body of the dam the foundation was prepared for the full width at the bottom and, in addition, all material down to bed rock was removed for some distance downstream from the main dam. At the lower end, a low concrete wall was built across the valley and the natural rock was protected by masonry paving to form a stilling pool four feet deep where water and ice passing over the dam may fall and their force be broken without possibility of damaging the dam and also so that the water may be started downstream uniformly without eroding the channel.

In the bottom of the cut-off trench a series of holes were drilled 10 ft. apart and 20 ft. deep. Pure cement grout was then pumped into these holes until all the crevices in the undisturbed rock foundation were filled, and it was impossible to force in any more grout. The effect of this grouting is to extend an impervious curtain



A View of the Dam from the Down-Stream Side

into the undisturbed rocks to at least the depth of the drill holes. In some places, by reason of the depth of the excavation for the main dam, the depth of the cut-off and the depth of the drill holes, it is believed the valley has been sealed against the possibility of water flowing through the rocks for a depth of 50 ft. below the natural surface of the ground.

Building the Dam

After the masonry paving for the stilling pool had been laid and the two trenches filled it was possible to proceed with the construction of the main body of the dam. Below the ground line, concrete alone was used. Above the ground line, the exposed faces of the dam were built of rubble masonry. The stone comprising this masonry was of the largest size which could be handled by the equipment.

To start the main dam, concrete was deposited in forms up to the ground level. Above this point the rubble masonry facing was laid in courses approximately three feet high. In many instances this was a single stone, and some of the stones were as much as eight

feet long. This masonry was laid with mortar joints in the customary manner. After these walls had been built the intervening space, comprising the body of the dam, was filled to the top of the course with cyclopean concrete. The top of the dam is a coping composed of pre-cast blocks of reinforced concrete. The center of the dam contains a spillway section 150 ft. long and 4 ft. lower than the rest of the dam.

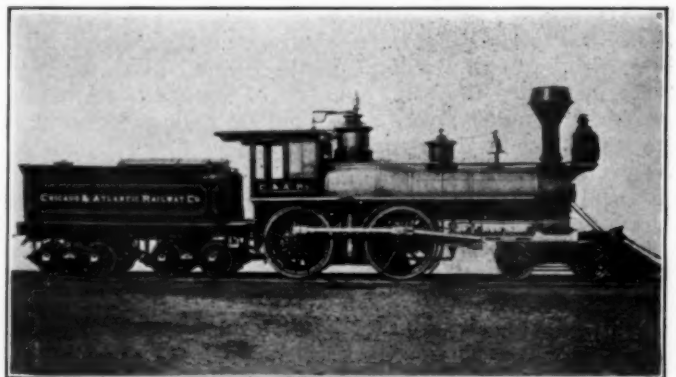
Provision was made in building the Tipton dam to take water at three different levels. This was done by building a vertical 24-in. pipe in the masonry with outlets on the upstream face. These outlets are controlled by sluice gates and protected by heavy racks, in order to keep debris out of the line.

The gate house, which contains the controlling valves, is located a short distance below the main dam and is built of the same stone as the dam. The valves and other required equipment are in the basement, while the upper portion of the structure is for use as a store or tool house. The main valve controlling the blow-off from the reservoir is in this gate house. It is an hydraulic valve, operated by means of a piston, working in a cylinder. A large water meter was also placed in the gate house to measure the quantity of water withdrawn from the dam.

As a part of the Tipton project, a small concrete intake dam was built on Loup Run, a tributary of Tipton Run, entering the main stream a short distance below the Tipton dam. This intake is a solid concrete structure built on a substantial shale foundation. It does not impound much water, as its function is solely to divert the flow of Loup Run into a pipe line which conveys it around the nose of the mountain into the Tipton dam.

The line carrying the water from the Loup Run intake to the Tipton dam is of reinforced concrete pipe, cast in eight-foot lengths and having bell and spigot joints. It was carefully laid to a uniform grade, so that if the water is shut off at the Loup Run end all of the water in the pipe line will drain into the Tipton dam. This concrete pipe line is about 4,300 ft. long and is of such a size as to carry practically all the flow of the run.

The entire project was designed and carried out by the water company's organization of which W. B. McCaleb is general superintendent. The preparation of the designs and the specifications was handled by the writer who was also in general charge of the work. The field work was directed by Crosby Tappan, resident engineer. J. W. Ledoux, Philadelphia, Pa., was retained as consulting engineer. The contractor was A. L. Anderson & Bros., Altoona, Pa. The total cost of the work was approximately \$600,000.



An Old Chicago & Atlantic Locomotive—Later on the Chicago & Erie Line of the Erie

Meeting of Transportation Division, A. R. A.

*No major changes in Car Service Rules found
necessary*

THE annual session of the Transportation Division, American Railway Association, was held at the Jefferson Hotel, Richmond, Va., on April 8, with an attendance of about 150 transportation officers. W. A. Worthington, assistant to chairman and vice-president of the Southern Pacific, and vice-chairman of the division, presided in the absence of Chairman J. J. Bernet. Addresses were made by R. H. Aishton, president of the A. R. A., E. J. Pearson, president of the New York, New Haven & Hartford, and the member of the executive committee of the A. R. A., assigned to supervision of the work of the Transportation Division; Donald D. Conn, manager of the public relations section, Car Service Division; W. P. Bartel, director of the Bureau of Service of the Interstate Commerce Commission; and M. J. Gormley, chairman of the Car Service Division. Many references were made to the remarkable accomplishment of the railroads during the past two years in handling a record volume of traffic without car shortage and a large share of the credit for the resulting improvement of the relations between the railroads and the public was assigned to the car service officers; emphasis was laid on the necessity for constant improvement in order that the present friendly attitude of the public may be maintained.

Mr. Worthington, in opening the meeting, said that railroad conditions have apparently become stabilized on the basis of high prices and wages and moderate rates and that this makes it necessary for railway officers to be constantly on the alert for ways of increasing the efficiency and economy of operation. As the railways have never yet at the same time or for a whole year attained the objectives of 30 miles per car per day, 30 tons per car, and 30 per cent empty car mileage, they still have a mark to aim at and a large share of the responsibility rests upon the transportation officers.

Mr. Aishton said he was addressing the body of men who in the last analysis are most responsible for the changed public opinion that has been brought about in the past two or three years. He referred to a conversation with a Cabinet officer at Washington who had told him that he had never realized the reasons for the differences between the farmers and the railroads until the last two years, when the roads always had a car ready for the farmer's shipments, and that this meant more to the farmer than any phase of railroad transportation. To illustrate the fact that adequate transportation is one of the reasons for cheap money at this time, because capital is not tied up in goods for so long, he quoted a Montana sheep raiser who said that he formerly used to figure about a dollar shrinkage in each lamb sent to market, but that now there is no shrinkage; also the manager of a larger copper company who made a check on several hundred cars of ore and found that the average time required for transit had been reduced from 27 to 13 days, producing a saving in interest alone that would go a long way toward paying the freight bill. Mr. Aishton referred to the fact that the railways are still earning less than a fair return to show that the Transportation Division and the railways still have a task to answer the questions bound

to arise, as to the economy with which railroad service is performed. As long as the "three thirties" remain unattained, and as long as the freight claims amount to approximately \$50,000,000, as they did last year, he said, opportunities are presented for the Transportation Division to do constructive work and make progress, and he expressed the opinion that the question of economy is to be an important one in the minds of the public and public officials. In conclusion he said that the public is going to go on demanding constant improvement on the part of the railroads and he emphasized that when things are going well is the time to look out for opportunities to do better.

Mr. Conn discussed the importance of getting a better turnover of the capital invested in freight car equipment by coming nearer to filling the cars to capacity and increasing the trainload and car mileage. He also emphasized the necessity for constant improvement to maintain the favorable public opinion that the railways have recently enjoyed, saying that public relations work means more than publicity work, it means building up public confidence in the railroads in respect of adequate transportation, wise expenditures, and rates in relation to the service received. He said great progress has been made in the last two years but that there is more to be done and he asked each transportation officer to do what he can toward building up this public confidence in his territory.

Storedoor Delivery

Mr. Pearson discussed various ways in which efficiency may be increased in switching and freight handling and the changes in design to fit new ideas which the transportation department should call to the attention of the engineering departments when new freight stations or rearrangements of facilities are designed. He also discussed the subject of storedoor delivery, saying that the public wants it, although it probably does not understand just what it wants, and that it is perhaps the job of the railroads to exercise leadership to see what may be accomplished for the benefit of both the railroads and their patrons. The public is now paying for the trucking between the freight house door and the door of the shipper or receiver, and shippers have expressed a willingness to continue to pay for this service if some system of accomplishing it under railroad supervision can be worked out, without endeavoring to make it come out of a rate already too low. The problem in general is simple but it must be worked out with reference to each community involved. The work should be retained in the hands of those who are now handling it and the truck owners would receive advantages from working with the railroads by avoiding the many wasteful light movements.

Progress would be made if shippers would agree to use such a service, which should be optional but with a requirement that it be used regularly or not at all, not merely used in times of bad weather or peaks. The advantages of storedoor or delivery, Mr. Pearson said, would lie in substituting one transaction for the three now involved in getting a shipment from sender to consignee;

better service, because trucking would move normally and promptly and in time with less cost; the railroads would regain some freight they are now losing to the motor trucks; freight houses would be more quickly cleared and freight house practice would be simplified. There should be some central office to publish monthly a list of the points where such a service had been arranged and the rates, so that it would be possible for a shipper to send freight to the consignee's door in one transaction. Such a plan would be hailed with delight by the public and the railroads could win a large degree of credit if they could bring it about.

Mr. Bartel gave figures showing the improvement in railroad service and said that the commission is now receiving very few complaints but many commendations of railroad performance. He referred to his remarks at previous meetings in which he had urged that more attention be paid to pre-classification of freight cars and said that progress had been made in this direction. He said the railroads should be justly proud of the service they have rendered but should give due credit to the co-operation of the shippers.

Chairman Gormley of the Car Service Division reviewed the accomplishments of the past two years with particular reference to the satisfactory operation of the present Car Service Rules and the work of the Car Service Division. An abstract of Mr. Gormley's paper follows:

Observance of Car Service Rules

By M. J. Gormley

Chairman, Car Service Division, American Railway Association

Very great progress has been made by the railroads in improving transportation, in their performance in handling cars under the Car Service Rules, by the establishment of better relations with the shippers and particularly by co-operation through the medium of the Shippers' Regional Advisory Boards. The Car Service Division now has through this same medium, and also by the placing of district managers in various parts of the country, established the means of obtaining reasonably accurate forecasts of transportation requirements and are better equipped than ever heretofore to regulate equipment distribution to meet the necessities of the country from time to time.

When the railroads adopted their now famous Program of April 5, 1923, "to provide adequate transportation service," the main question in their minds, and likewise that of the public, was—"Can the railroads provide adequate transportation to meet the continually growing needs of the country?" Subsequent events, as you know, have demonstrated beyond all doubt that the best transportation service in the history of the country has been provided in the past two years. Now the credit for this performance cannot be assigned to any one factor, but many things are responsible for it, and we believe some of the outstanding reasons for that remarkable performance are:

- (1) Large capital expenditures for locomotives, cars, improved terminals, additional tracks, grade reductions, etc.
- (2) More complete co-operation among the railroads themselves and with the Car Service Division than ever before.
- (3) The most complete co-operation by the shippers with the railroads, and particularly through the medium of the Regional Advisory Boards, that ever heretofore existed.

All of these things brought about more prompt handling of equipment, and by the better observance of Car Service Rules resulted in better location of equipment

throughout the whole country and more cars on their owners' rails during the past two years than ever in the past during any similar period.

As to Car Service Rules observance, we have figures showing that of approximately twenty-one million foreign freight cars loaded and checked, as reported by the railroads from July, 1923, to February, 1925, 81 per cent were loaded in accord with the rules. During this same period, Car Service Division representatives checked a total of approximately one million foreign cars and of these 20.3 per cent were loaded contrary to the rules. This latter check includes all technical violations and no deductions have been made for loading cars contrary to the rules even when proper cars were not available. It has been our opinion for some time, and this is confirmed by the experience of the past year, that if 85 per cent of the loading of foreign cars on a railroad were loaded in accord with the rules that performance would automatically re-locate to the owners' rails sufficient cars to meet their necessities and to permit of proper maintenance of the equipment.

Under the automatic working of the rules, and without special orders of the Car Service Division as to re-location, we had a larger and more satisfactory westbound empty movement of box cars of western ownership from the east to the west during the year 1924, and particularly during the period prior to the movement of the western crops, than at any time in the past. This movement was carried on from day to day in an orderly way and clearly demonstrates that a proper carrying out of the rules will, without difficulty, insure constantly a return of sufficient equipment to the western roads to meet their necessities. This requires constant supervision on the part of the railroads and the Car Service Division. Shippers have rendered valuable assistance in regulating their own loading to carry out this general plan. The records of the Car Service Division are now so established that we know, under normal crop conditions in the west, that beginning not later than the first of May of each year we must have a westbound movement of empty cars of western ownership, day by day, equal to that of 1924 if the railroads are to satisfactorily meet the demand for the movement of the agricultural products of the west. The movement of the western agricultural products is one of the largest problems with which the Car Service Division has to deal, for the reason that it is a larger producing section than it is a terminating territory and must continually receive empty cars to meet the requirements in that territory. Anything in the east or the south that interferes with the orderly day to day movement, either loaded or empty, of these western cars would very soon cause serious difficulty in the western territory. Our efforts, therefore, are continually in the direction of bringing about better observance of the Car Service Rules, particularly with respect to the western owned equipment, to insure its automatic daily return to the owners, either loaded or empty. In connection with the observance of the Car Service Rules, it has been established beyond any question of a doubt that the greatest contributing factor to the success of the grain movement in the west is the observance of Junction Rule 2 at the grain terminals. During several years of the past, when grain arrived at a terminal on one line and was delivered to a connecting line for unloading, the cars were absorbed by the receiving line and not returned, as they should be, to the delivering line. There was a very greatly improved performance in this respect during the year 1924 and in fact in some terminals it was almost 100 per cent. We have a record of three adjoining western terminals where, during the months of August, September, and October, 45,000 carloads of grain were handled in and out of the terminals and approximately 60 per cent of it moved out over lines that did not

bring in the grain, leaving an opportunity for the misuse of the owners' equipment. The facts are that in the movement of this 45,000 cars of grain only 238 cars were not returned to the delivering lines, which insured a continuous supply of empty equipment from these terminals for return to the loading territory.

Let us consider what might have happened if the rules were not observed in this manner and if the cars when delivered to connections were loaded out by them instead of being returned to their owners. This would scatter the cars that were accumulated for the grain movement all over the country and they would have largely gone into the movement of other lines of traffic not requiring that class of car and there would consequently have been a shortage in the grain territory. I cite this example to show the extreme importance from the standpoint of the grain shippers of carrying out the rules in the grain terminals. We might add that we had several cases where the wrong cars were spotted for loading and the grain concerns themselves refused to load them, knowing that by doing so they would deprive the country elevators of that equipment. The grain handling people at all the terminals took a very active interest in this matter last year. The railroads, having established the adequacy of equipment, and with the co-operation of the shippers, continually improving observance of Car Service Rules, we believe it is essential and the duty of the Car Service Division to bring about the most complete compliance possible with Car Service Rule No. 1, particularly as it applies in a territory where there is loading at all times to or in the direction of the owning lines. This condition exists with respect to the loading from the south or southwest and the west to the eastern territory and as applied to eastern owned equipment, there being always a necessity for an empty movement of equipment from the east and the south to the west. It is not practicable or desirable to attempt to restrict the westbound empty movement from those territories.

The failure to comply with Car Service Rule No. 1 from the producing territories to the consuming territories in the direction of the heavy loaded movement we have not considered very serious, but at the same time we know it to be of sufficient importance to attempt, by the use of restricting orders of the Car Service Division, to bring about a more intensive application of Rule No. 1. These restrictive orders have been in effect for a considerable period in the south, the southwest, and the west and the record, in our opinion, now shows that this has not imposed any undue burden on any railroad and, in fact, indicates that in all districts covered by the orders the railroads have on their lines less of what are known as the Eastern and Allegheny box cars during the period these orders were in effect than during the previous year when they were not in effect. This, we believe, indicates that this class of equipment, due to the restrictive orders, has received special attention in loading, with the result that the cars have been disposed of more promptly to their owners under load than they have heretofore if they had been moved empty. As these orders are better understood the performance thereunder is improving. In certain districts we have found it advisable, due to the trend of traffic, to make some modifications with respect to the home route feature and these modifications will be extended as investigation and records show the necessity therefor. The arrangement is working out with the greatest satisfaction and we believe it will only be a question of a short time that this principle of a greater compliance with Car Service Rule 1 will be so well established with the subordinate officers, agents, and others, as well as the executives, that we will see in the not far distant future an almost ideal situation from every standpoint in the handling of cars in this country. All that

is required to bring this about is constant supervision and investigation as to the necessities in the various territories on the part of the individual railroads and the Car Service Division.

The reports of the various committees were received and approved with very little discussion. The report of the General Committee, C. W. Crawford, chairman, said that during the past year it had approved the applications of 23 roads for admission to the Car Service and Per Diem Agreement, rejected the application of one road, and recommended the suspension from the agreement of one road.

Upon request of the roads directly concerned, joint checks of the records have been made under the supervision of the General Committee at 20 points, to determine the average time required by each road to handle cars in switching service and fix the reclaim at the figure determined by such check.

The general effect of these checks has been a reduction in the reclaim previously allowed, which indicates that there has been a general improvement in the time required to handle cars in switching service. In addition thereto, the committee has supervised a check of the records of 17 industrially controlled switching railroads, which are subscribers to the Car Service and Per Diem Agreement, and in each case, the reclaim has been fixed at the actual figure determined by the check.

In its last report the committee alluded to a study which was being made of the application of the Birmingham Southern Rules where such rules had been prescribed by the Interstate Commerce Commission in lieu of the previous per diem and reclaim arrangement. As a result of this study and in the light of actual experience under these rules, after obtaining the views of the interested trunk line carriers, the General Committee recommended that the Interstate Commerce Commission reopen the cases in which these rules had been established, rescind the orders entered therein and require those roads which have been found to be common carriers to make settlement for the use and detention of foreign cars in accordance with the Code of Per Diem Rules. As there was an unwillingness on the part of the commission to treat this recommendation as a sufficient basis for general action and reopen the cases on its own motion, the committee has recommended that the interested trunk line carriers proceed to file formal petitions in order to bring about the desired results.

While the so-called Birmingham Southern Rules were originally intended by the commission to take the place of the per diem and reclaim arrangement in the settlement for car hire with industrially controlled switching railroads, a number of short line railroads, not industrially controlled, have sought the application of these rules in complaints filed with the commission. Several hearings have already been held at which the committee was represented and presented testimony in support of maintaining the per diem rules, and until these cases are decided, the committee emphasizes the importance of all members of the association adhering strictly to the provisions of Per Diem Rule 6 in the settlement for car hire with their non-subscriber connections.

The General Committee concurred in the recommendation of the Mechanical Division that all freight car equipment be marked with maximum load limit as well as nominal capacity, on account of the difficulty and confusion in determining the allowable lading that may be placed on a car from the weight marking stencilled thereon, as well as from provisions of Interchange Rule 86. The details of this method of marking are fully covered in the report of the Committee on Car Service and the General Committee has recommended to the board of directors that the plan be submitted to the

membership of the association for a vote by letter ballot.

Circular No. 2,514 was issued February 18, 1925, requesting statistics from all members relative to freight cars owned, cost and maintenance, for the calendar year 1924. Sufficient replies have not yet been received to enable the committee to present a summary of this data at this time but a summary will be sent to all members as soon as the figures are available.

The Committee on Car Service, J. E. Roberts, superintendent transportation, Delaware & Hudson, chairman, reported that the conditions with respect to car handling during the past year have not been such as to make necessary or desirable major changes in the basic rules and practices. The committee has considered and disposed of a number of questions and controversies arising under the Code of Car Service Rules.

On account of the difficulty and confusion in determining the allowable lading that may be placed on a car from the weight marking stencilled thereon, as well as from the provisions of Interchange Rule 86, after conference with representatives of the Mechanical and Traffic divisions it was agreed that all freight equipment should be marked to show load limit as well as the nominal capacity. To make this plan effective a number of changes in Rule 11 of the Code of Car Service Rules were recommended and approved by the vote of the meeting, as were other recommendations of the committee.

On account of the lack of uniformity in the application of Car Service Rule 12, the committee recommended that the previous interpretation concerning the placing of advertisements, banners, etc., on the lading or stakes on open cars be amended to read as follows: "Advertisements or banners may be applied to the lading or to temporary stakes necessary to secure lading; it is not permissible to attach such banners or advertisements to permanent stakes which are a part of the car or on temporary stakes supplied by shipper solely for the purpose of carrying advertisements or banners."

A change in Per Diem Rule 5 and Rule 2 of the Code of Switching Reclaim Rules was recommended to the end that intermediate switching roads may be reimbursed for the actual per diem accruing, with a reasonable maximum, on cars handled for other roads.

The Committee on Railroad Business Mail, H. L. Fairfield, manager baggage and mail traffic, Illinois Central, chairman, reported that no questions involving any change in the regulations covering the handling of railroad business mail have arisen since its last report. The attention of certain roads has been called to failures on the part of employees in addressing or routing mail or in using railroad business mail when postage should have been applied. In general, the handling of railroad business mail has become well standardized and its principles established.

The Committee on Demurrage, Storage, Reconsignment and Diversion, J. F. Porterfield, general superintendent transportation, Illinois Central, chairman, reported that it has considered and disposed of numerous controversies and questions arising under the demurrage and storage rules. Upon recommendation of the committee, following a decision of the Interstate Commerce Commission, the rule governing application of demurrage charges at by-product coke ovens was revised and published to take effect on September 30, 1924.

Request was made upon the committee by the National Sand & Gravel Association for an amendment to the rules which would provide for the exemption from demurrage of empty cars placed for loading at sand and gravel pits and cars under load with sand or gravel at such pits, and for the application of distribution rules in lieu of demurrage rules.

At a conference with representatives of the association,

the argument was put forward that shippers of these commodities should be treated the same as the shippers of coal with regard to both demurrage and car distribution rules. The committee rejected this request on the ground that there was no similarity between coal mines and sand and gravel pits, and there appeared to be no more reason why cars for loading sand and gravel should be made exempt from the application of demurrage charges than there would be to exempt a variety of other commodities, whereas coal mines have a rating which is a guide to the railroad company in furnishing cars and under which the shipper has no authority to order cars without limit, but is confined to his rating and the cars are furnished accordingly.

Circular No. D II-178 was issued January 15, 1925, giving the following interpretations:

"Question: A shipment is tendered for forwarding contrary to existing embargo, and for that reason the railroad refuses to issue bill of lading. Does demurrage (in addition to any demurrage that may have accrued prior to tender of car for forwarding) accrue while the car is being held for the embargo to be lifted or for other disposition by the shipper, under the following conditions:

"(a) When, at the time the empty car was furnished upon order of the shipper which specified the character of the shipment, consignee, route and destination, an embargo was in force, but the carrier failed to advise the shipper of the embargo.

"Answer: No.

"(b) When, at the time the car was furnished, the shipper did not disclose the character of the shipment, consignee, route and destination, or if the car was appropriated by the shipper for loading without authority of the carrier.

"Answer: Yes; and if the car is unloaded and released empty, no free time should be allowed. See Rule 6, Sections B and D.

"In connection with the above interpretations, attention is also called to the provision of Per Diem Rule 16, reading as follows:

"When a road gives notice that for any reason it cannot accept cars in any specified traffic, thereby laying an embargo, it should receive cars already loaded with such traffic on the date such notice is issued, and cars loaded within 48 hours thereafter."

It was recommended that all members of the association be governed accordingly.

The committee has given consideration to an increase in the demurrage rates on refrigerator cars, especially during times of acute demand for this class of equipment, also to the establishment of a penalty charge which would prevent the peddling of fruits and vegetables from railroad cars while standing on railroad tracks. It is the opinion of the committee that delays to refrigerator equipment are objectionable regardless of the cause of detention and that it is unwise to penalize delays due to peddling unless similar delays arising from other causes are also penalized. The chairman of the Car Service Division conferred with representatives of the various fruit and vegetable shippers' and receivers' organizations and inaugurated a plan to secure the co-operation of shippers and receivers, with a view to reducing delays to refrigerator equipment to the lowest possible minimum. It was, therefore, decided to defer action on the question of increasing the demurrage rates on this class of equipment until experience has been gained under this co-operative plan, on the understanding that if it becomes necessary at a later date, to take further action, the question will be again considered.

During the past year the committee has been successful in getting a number of roads to withdraw requests for the publication of individual exceptions to the uniform demurrage tariff. Exceptions which tend to make the rules more liberal lead to demands on the part of other roads for similar exceptions and thus tend to destroy the effectiveness of the rules.

It is the opinion of the committee that when a road executes the Car Service and Per Diem Agreement, it obligates itself to publish the National Car Demurrage Rules without any exceptions, and that the publication of an exception to the rules is equivalent to a violation of the Car Service and Per Diem Agreement.

The Committee on Freight Handling Service, F. W. B. Humes, superintendent stations and transfers, Eastern

Region, Pennsylvania, chairman, recommended a new resolution to supersede the rules relating to the tracing of shipments, "that the co-operation of shippers be secured through the various Regional Advisory Boards and other agencies, to the end that no tracers shall be started either by wire or mail until shipments shall have had sufficient time to reach destination." The committee has brought together in one pamphlet the various suggestions and practices that are in effect with respect to the proper handling of hogs, which were submitted for approval as recommended practice. A pamphlet was also submitted covering methods for inspecting, preparing and cooping cars for bulk grain loading and methods for releasing grain doors from cars and for protection of grain doors, which are in effect on a number of roads and represent what the committee believes to be the best practice. In view of statements submitted by the Trunk Line Freight Inspection Bureau showing a heavy loss of revenue through payment of claims on shipments of sterilized or processed eggs, originating at Pacific coast points, it was recommended that the Pacific coast lines be requested to establish immediately inspection at shipping points through the weighing and inspection department of the Transcontinental Freight Bureau.

The committee is receiving the co-operation of the shippers, through the various Regional Advisory Boards, in its efforts to secure better loading methods. It has requested the shippers to submit through these boards their suggestions for improvements in present methods which will be to the best interests of both carriers and shippers.

Members of the association are urgently requested to report, wherever possible, cause of loss and damage to carload freight to originating lines direct or through the proper weighing and inspection bureaus, who are glad to investigate and handle each complaint with the shippers. The committee has taken care of and disposed of effectively and satisfactorily a number of complaints in this manner, without the necessity of issuing any circulars.

The committee has under consideration the advisability of issuing, as recommended practice, one or more plans covering the affirmative loading of package freight. It is the committee's view that if some standard practices along these lines can be generally adopted, the results will be very advantageous and the committee hopes to reach some conclusion in this matter in the near future.

Among the subjects calling for careful consideration of the committee during the ensuing year, none appear to be more important than that of recommended practice in the matter of both less-carload and carload loading of various commodities. Considerable work has already been done along this line and the committee is organized to pursue the matter thoroughly with due consideration of all that is involved.

The Committee on Records, J. D. Altimas, assistant general superintendent car service, Canadian Pacific, chairman, reported on a number of matters previously covered by circulars and made recommendations and suggestions relating to the application of per diem rules, etc.

Members of the General Committee, with terms to expire April, 1928, were elected by letter ballot, the result of which was announced at the meeting, as follows: Eastern Territory—G. Metzman, transportation assistant to president, New York Central Lines; Western Territory—W. A. Worthington, vice-president and assistant to chairman, Southern Pacific; Southwestern Territory—J. Cannon, general manager, Missouri Pacific; Southern Territory—W. S. Andrews, assistant vice-president, Southern. The General Committee elected W. A. Worthington vice-chairman of the division for the term expiring April, 1926.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended April 4, which included a holiday in many of the mining districts on April 1, amounted to 922,375 cars, an increase of 60,385 cars as compared with the corresponding week of last year and an increase of 26,000 cars as compared with 1923. Grain and grain products, livestock and coke showed decreases as compared with the corresponding week of last year but coal, forest products, ore, merchandise and miscellaneous freight showed increases and the increase in miscellaneous freight amounted to 43,811 cars. Total loading of miscellaneous freight reach the high figure of 365,672 cars. All districts showed increases as compared with last year except the Central Western. The summary, as compiled by the Car Service Division of the American Railway Association follows:

REVENUE FREIGHT CAR LOADING—WEEK ENDED SATURDAY, APRIL 4, 1925			
Districts	1925	1924	1923
Eastern	\$224,062	\$211,779	\$222,224
Allegheny	191,875	178,355	194,457
Pocahontas	41,324	34,132	35,743
Southern	157,677	138,414	139,919
Northwestern	114,333	109,919	115,289
Central Western	127,817	128,747	132,707
Southwestern	65,287	60,644	56,036
Total Western	307,437	299,310	304,032
Commodities			
Grain and grain products	34,259	35,096	39,306
Livestock	23,853	28,590	30,230
Coal	131,487	123,203	164,195
Coke	12,079	12,300	16,076
Forest products	79,661	77,491	73,825
Ore	13,110	11,837	15,346
Mdse., L.C.L.	262,254	251,612	234,506
Miscellaneous	365,672	321,861	322,891
Total	922,375	861,990	896,375
March 28	931,395	907,389	936,274
March 21	909,363	908,390	916,818
March 14	924,149	916,762	904,116
March 7	930,909	929,381	905,344
Cumulative total fourteen weeks....	12,687,610	12,450,001	12,213,110

The freight car surplus in the week ended March 31 averaged 344,959 cars, an increase of 24,394 as compared with the previous period. This included 185,724 coal cars and 113,615 box cars. The Canadian roads for the same period had a surplus of 29,250 cars, including 25,125 box cars and 300 coal cars.

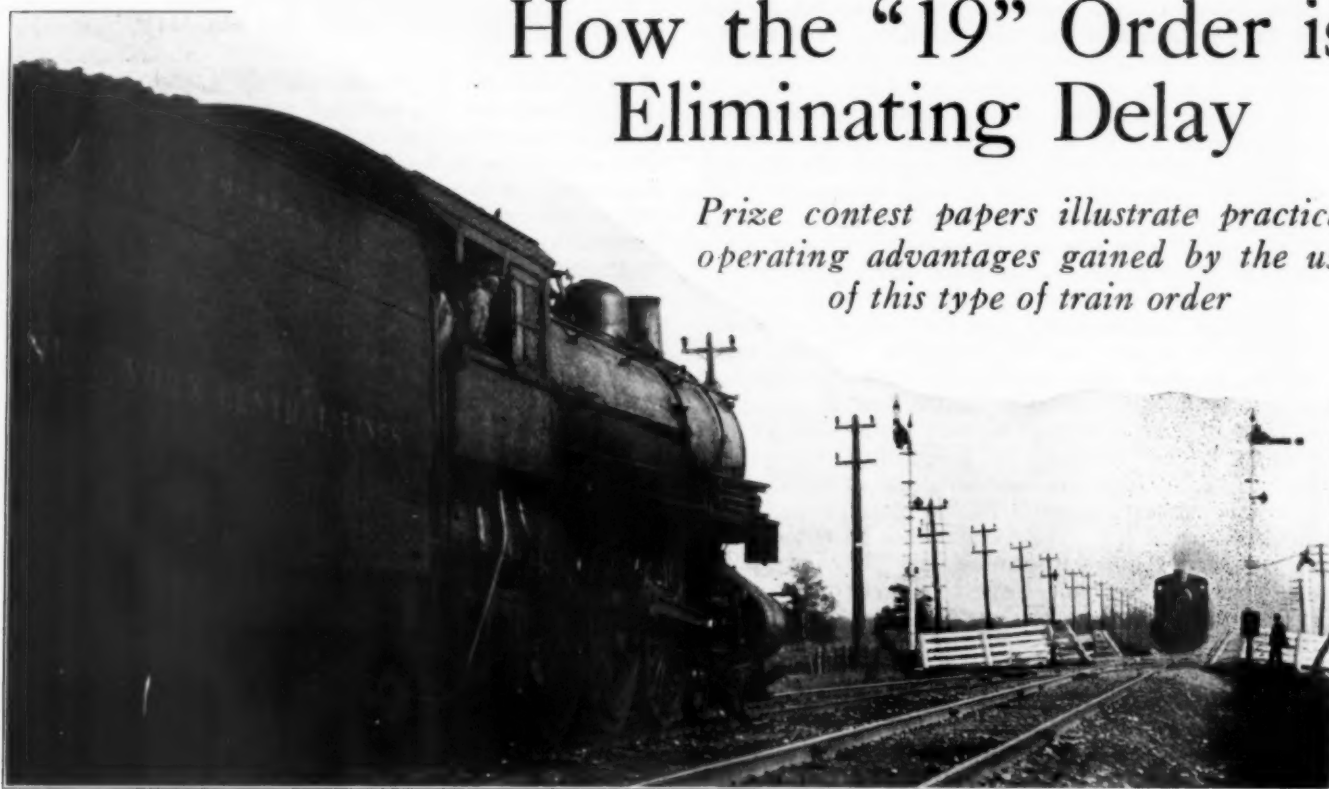
Car Loading in Canada

Revenue car loadings at stations in Canada during the week ended April 4 totalled 51,398 cars, a decrease from the previous week of 1,125 cars. Grain loadings improved in the East but declined in the West, showing a net loss of 663 cars. Pulpwood declined 859 cars, practically all in the East. Pulp and paper and other forest products also showed decreases. Merchandise was heavier in the East by 419 cars and in the West by 497 cars. Compared with the same week last year the total loadings showed a decline of 824 cars, grain being heavier by 686 cars, merchandise by 1,000 cars and miscellaneous freight by 364 cars, but lumber, pulpwood and other forest products showed decreases.

Commodities	Total for Canada			Cumulative totals to date	
	Apr. 4 1925	Mar. 28 1925	Apr. 5 1924	1925	1924
Grain and grain products	6,287	6,950	5,601	90,673	110,026
Live stock	2,494	2,412	2,374	31,759	30,156
Coal	2,465	2,631	4,001	71,251	68,410
Coke	275	270	249	4,408	3,690
Lumber	3,514	3,600	3,823	41,017	46,247
Pulpwood	2,933	3,792	3,799	55,623	56,186
Pulp and paper	1,993	2,130	1,948	29,633	30,293
Other forest products	2,548	3,082	3,080	45,369	43,777
Ore	1,279	1,119	1,101	16,361	13,217
Merchandise l. c. l.	16,322	15,406	15,322	196,878	180,349
Miscellaneous	11,288	11,131	10,924	140,115	146,175
Total cars loaded	51,398	52,523	52,222	723,087	728,526
Total cars rec'd from connections	33,905	34,535	34,820	467,168	489,063

How the "19" Order is Eliminating Delay

Prize contest papers illustrate practical operating advantages gained by the use of this type of train order



The Use of the "19" Order Expedites Train Movements

THE contest on the use of the "19" train order sponsored by the *Railway Age* brought forth a large number of excellent papers by operating officers describing ways in which the "19" order had actually aided the movement of traffic on their lines. The first prize of \$125 was awarded to V. Parvin, superintendent, Ann Arbor, Owosso, Mich., and the second prize of \$75 to C. H. Carter, system transportation inspector, C. R. I. & P., Chicago. The judges also gave special mention to the papers prepared by A. G. Smart, general superinten-

dent, C. B. & Q., E. R. Guye, train dispatcher, O. W. R. R. & N.; Leo F. Creagan, train dispatcher, U. P.; H. G. Duckwitz, service bureau, Illinois Central; Paul H. Pearson, assistant train dispatcher, B. & M.; W. T. Quirk, general inspector of transportation A. T. & S. F., G. E. Collingwood, editor, Standard Train Rules Examinations; Harris C. Cross, train dispatcher, St. L.-S. W. and T. F. Gibbs, rule instructor, G. T. Mr. Parvin's paper with two others appeared in the *Railway Age* of February 21, page 461. Mr. Carter's paper follows:

The "19" Order a Success on the Rock Island

By C. H. Carter

Assistant Transportation Inspector, Chicago, Rock Island & Pacific, Chicago

More than seven months of unrestricted use of the "19" train-order on the Rock Island Lines has demonstrated its practicability. I say unrestricted, although not entirely so, but the restrictions that are imposed are technical and do not enter into the delays to trains. One of the restrictions requires the use of the "31" order in non-automatic block territory when restricting a train at the station where the order is received. We have minimized the delay incident thereto by providing a rule which permits the engineman to sign the order, receive his copy, sound the restricting signal to the train crew and execute the order. The conductor at the rear of the train receives his copy as the train moves forward. The "19" order is used for such restrictions in automatic block territory, the train being brought to a stop.

Objections That Have Been Overcome

We take it for granted that the accuracy in transmitting, repeating, understanding and executing the "19" order as

compared with the "31" is now conceded. We are agreed that the train-order signal in the stop position will stop trains for a "19" order as effectively as for a "31" and that a train and engine crew will not leave a station while the stop signal is displayed without a clearance card showing the order numbers, if any, for their train. We have demonstrated that an engineman approaching a train-order signal in the stop position will bring his engine to a stop at the train-order signal unless the operator is out to deliver the orders. The rule mentioned in the first paragraph, which permits the engineman to sign "31" orders, acts as an automatic safeguard in bringing trains to a stop with the engine of such a train at the train-order signal. The predominating thought that seems to delay the adoption of the "19" order in general has to do with the assurance that these orders will be placed in the hands of the conductor and the engineman.

Railroads that have used the "19" order in automatic block territory for a number of years, have conducted and

are still conducting tests to determine the accuracy with which the train dispatcher checks the order numbers repeated to him by the operator from the latter's clearance card. These tests have developed failures on the part of the dispatchers. The dispatcher has encountered failures on the part of the operator without tests.

The prevailing practice as I have found it, governing the delivery of the "19" order, is for the operator to enter all order numbers on a clearance card, then repeat these numbers to the train dispatcher, who will enter them on a page in his train-order book. If the dispatcher finds that all of the orders for that train have been repeated by the operator, he transmits his "OK," the time, and either his, or, according to requirements, the chief train dispatcher's initials, which the operator enters on the clearance card in the place provided. In practice it has been found that some dispatchers will depend upon their memory in checking these order numbers, particularly when they are busy. To make an accurate check the dispatcher would be compelled to scrutinize the address on all of the uncanceled orders in the order book each time the operator repeats numbers to him from a clearance card. This is quite impracticable and for this reason, together with the known failures already mentioned, the Rock Island Train Rules Committee has tested and adopted for the use of the train dispatcher a loose leaf form on which he records the station designation, address, and order number of all orders. This record is made at the time the orders are transmitted.

Safer Than Form "31"

As one may expect with any new departure from custom, this loose leaf form was not at all popular when first introduced, but after more than seven months' service it has proved to be valuable and accurate, and is considered indispensable by most of our dispatchers. The method has this advantage over the prevailing practice: the dispatcher places the orders on this record at the time they are transmitted and he has his own checking system to indicate that he has done so. As a result, he carries with him constantly the total outstanding orders that are to be delivered, in compact form, for instant reference and does not need to refer to the train-order book and check each address of each order before he can "OK" a clearance card. This method has solved the problem of placing train-orders in the hands of the conductor and engineer and we consider it safer than the delivery of the "31" orders.

In making his transfer, the dispatcher will enter on a new clearance leaf, all of the outstanding orders for delivery. The relieving dispatcher checks these orders at the time he reads the orders in his transfer. This places in front of the dispatcher who is just "sitting in" all of the orders to be delivered, which he may check and "OK" as rapidly as repeated to him by the operator. Without this feature, the dispatcher, after reading his transfer of 30 or 40 orders, not having the contents of the orders thoroughly fixed in his memory, could not give his "OK" to clearance cards safely and promptly without making a thorough check. It is at transfer time, or immediately afterwards, that failures are most likely to occur.

Advantages of the "19" Order

The advantages that we have gained from the use of the "19" train-order, cannot be determined accurately in dollars and cents without an expensive system of checking, which would necessarily have to be done while the "31" order was in use. This was not done owing to the fact that there was no money investment involved other than the cost of printing the rules. Therefore, we can only state and claim a portion of the visible advantages that are

reflected in the operating statistics. These statistics reveal that we have increased locomotive miles and decreased the number of locomotives; increased car miles and decreased overtime; increased the train haul and decreased the fuel consumption; increased the number of "on time" trains and decreased damage to draft rigging and, last but not least, increased the interest of the men in keeping their trains moving.

The Function of the Calling-On Signal

The "19" train-order must share its popularity on our lines with the "calling-on" signal which was made possible by discontinuing the use of the diagonal-yellow position of the train-order signal for the delivery of "19" train-orders and utilizing this position for a "calling-on"

OFFICE DESIGNATION	ADDRESS	ORDER NOS.	TIME OK
CA	1st 95	5	1210a
CB	Westward train	6 #	
BU	Eastward train	6 #	
RY	Exa 2632 East	8	1245a
RB	Exa 2690 West	9	1255a
RC	Exa 2695 West	9	1259a
CM	No 94	⑨ 12 #	
CH	No 2	10-12 #	
CV	No 1	10-12	140a
CR	No 89	11-13	151a
BU	No 90	11-12-6 #	
BM	1st 56	14	211a
BR	1st 59	14 #	
BC	2nd 59	14	217a

Train Dispatcher's Loose Leaf Clearance Record

*The blank spaces where time in figures is not shown, indicate that these orders have not been delivered. The dispatcher can check such orders at a glance.

Note that order No. 9 had been issued to No. 94; order No. 10 to No. 2, and to No. 1. Later, the dispatcher issued order No. 12 to these three trains and added order No. 12 to those already recorded for those trains. After the dispatcher has filled in the "Time OK," he has finished with that item, and is concerned only with the blank spaces as indicated by the arrows. When an order is annulled to a train, the dispatcher marks it with a circle as indicated in order No. 9, addressed to No. 94 at CM.

In automatic block territory the Rock Island Lines do not require the dispatcher to check train-order numbers from the operator's clearance card. The operator issues the clearance on instructions from the dispatcher that there are no more orders for that train, or according to the general practice that exists in some cases, the dispatcher tells the operator to clear a train, and in either case the operator will ask the dispatcher if he may clear them. It will be noted that at BU orders No. 11 and No. 12 were issued to No. 90, and that order No. 6 was added, the latter order being taken from the blank column showing order No. 6, addressed to eastward trains at BU.

This loose leaf form is usually clamped onto a stiff back for the purpose of convenient handling.

signal. We use the three-position train-order signal; horizontal-red for stop; diagonal-yellow for "calling-on" and perpendicular-green for proceed. All train-orders are delivered on the stop position of the train-order signal. The "calling-on" position is used principally on single track. A dispatcher desiring to advance a train beyond the station it is approaching, issues the necessary order for its movement beyond such station. He then issues an order addressed to the operator reading "Move — on main track." Should the order addressed to the approaching train contain a time limit, the order addressed to the operator would also contain a time limit and read "Move

— on main track until —, naming a time that will safely allow the train to make the next siding. On receipt of the order addressed to himself, the operator will display the "calling-on" signal as directed. The engineman of the approaching train, observing this signal, answers it according to the rules and proceeds on the main track to the train-order signal where the crew of the train receives the helping order without stopping. The engineman's answer to the signal notifies both the train crew and the operator that the signal has been observed. The operator changes the signal to stop before delivering the order. If a train is delayed after accepting a "calling-on" signal it must be protected according to Rule 99.

This signal has proved so successful in keeping trains out of sidings that numerous requests have been received for the installation of distant electric "calling-on" signals at switches from which the train-order signal cannot be seen. The "19" train-order in conjunction with the "calling-on" has won the hearty approval of those concerned.

Inconsistency Holds On

There still remains with some, whose experiences of the past in the handling of orders proved unsuccessful, the conviction that the advantages are not worth the liabilities. The prevailing morale of the men who handle and execute orders, we should remember, has attained a much higher standard today than was prevalent during the saloon days. Our men today are reliable, alert, good citizens, progressive and are now capable of absorbing and executing instructions and rules that we could not have trusted them with in the past. Our methods of instructing the men have improved to such a degree that we feel that we can entrust them with changes in train rules, be they ever so radical. There are railroads that balk at the adoption of the "19" order, yet their rules do not require spelling of time in train-orders as they rely on figures. There are other railroads that place no restrictions on the use of the "19" order, but will not permit figures to be used in the body of a train-order unless accompanied by the words that spell such numbers.

There are three important points in connection with the adoption of the "19" train-order: (1) The correct wording of the rules governing their use; (2) Thorough instruction and drilling (an instructor should not finish with an employee until the latter can explain the rules to him), and (3) Safeguarding the delivery of orders.

The "19" order injected as a part of the equipment provided for expediting trains, would prove its value under conditions something like the following: A first-class limited train is cleared to move on time but it actually leaves 10 min. late. The dispatcher knows that it loses 3 min. in the first 9 miles. If he could give a fast meat or stock train the advantage of this 10 min. the latter train would be saved a delay of 35 or 40 min. The fast freight may make it without the help, so he dare not speculate on the time the fast freight may be delayed. As a result the latter train does not make it, and a less important train or two, running against the fast freight, receives, not only the delay occasioned by the late passenger train, but a reaction from the delay to the fast freight. A "19" order would have avoided all of these delays. This circumstance occurs several times daily on all sub-divisions.

Again, the dispatcher finds that he must place a "31" restricting order at the last stop, addressing the fast freight. He is careful not to use a figure that will delay the train addressed. After taking coal and water and looking the train over, it leaves 15 min. late on the order. This time cannot be used to assist opposing trains unless the first train is stopped and delayed an additional 15 or 20 min. in signing and delivering a "31" order. As a result the opposing trains must suffer a 30 or 40-min.

delay, when a "19" train-order would have moved them to a station where the only delay would have been that of moving in and out of a siding.

It is true that under the "31" order, fast freight trains move about as well as under the "19," except that they do not receive all of the time due them on limited passenger trains. The bulk of the delays occasioned by the "31" order are suffered by the inferior or less important trains.

No doubt there are some officers who still believe that a train dispatcher should not be permitted to use the 10 min. of the time that the fast passenger train was late. I think that this is a question which depends entirely upon conditions and circumstances. The fact that it should not be done in some instances should not justify blanket instructions to train dispatchers to keep 10, 15 or 20 min. off the time of passenger trains. Such instructions reveal a lack of confidence in the train dispatcher and the train and engine crews, particularly the crews that are using the time on passenger trains. If these crews are permitted to run against the "on time" time-table schedules and not against the figures issued by the train dispatcher, they soon discover why the dispatcher is not giving them close figures and they either suffer unnecessary delay or take a chance.

Every railroad has its arbitrary fast schedules, both passenger and freight. These particular trains are known to the trackmen, coal-chute men, pumpers, carmen, agents, operators, signalmen, switchmen and others; all of whom contribute somewhat towards providing a clear path for these important trains and each of whom has his part to play in the movement. The part these men play in doing their work well and quickly, is an exhibition of team work that is as interesting to the railroad man as is the strategy used in an athletic contest.

I believe that the most successful movement of both passenger and freight trains may be found on some of our western lines where the "19" order is in general use. On such lines, the train dispatcher, instead of keeping 10 to 20 min. off the time of a limited passenger train, is required to issue a wait order covering his sub-division, when such a train is reported late, specifying the maximum time the train can recover. All of the freight and inferior trains receive a copy of this order. Should the limited train become later, the dispatcher runs it 10, 15 or 20 min. late on the order, as the case may be. The idea is that the passenger train will recover more time on such an order and that the inferior trains receive the full benefit of the time such a train is late. It will be noted that the dispatcher is required to handle the trains in this manner.

A train-order running a passenger train 50 min. late, A to D, 40 min. late, D to G, 30 min. late, G to K, and 20 min. late, K to N, is an easy order for a train dispatcher to issue, but it is far from providing inferior trains with all of the time that is due them. They are deprived of 10 min. at every break in time. These points are of great importance in contributing to economical operation on single track. They have been tried, tested and proved. Perhaps, because they do not cost anything is the reason they do not attract more attention.

THE "soils demonstration train" of the New York Central, which has been making a tour of the company's lines in Pennsylvania, was visited by a hundred farmers on its arrival at Cherry Tree, Pa., on March 21. E. G. Reed, representative of the railroad company, with the co-operation of the state agricultural college makes tests of soils wherever desired, a corps of chemists traveling with the train. Some 80 samples of soil were tested at Cherry Tree; 57 at Philipsburg and others at other places.

Norfolk & Western Coaling Station is of Unusual Design

DURING the last week of March the Norfolk & Western placed in operation a large coaling and sanding plant of unusual design. It is located at Prichard, W. Va., where through main line trains are supplied with coal, sand and water and also dump cinders.

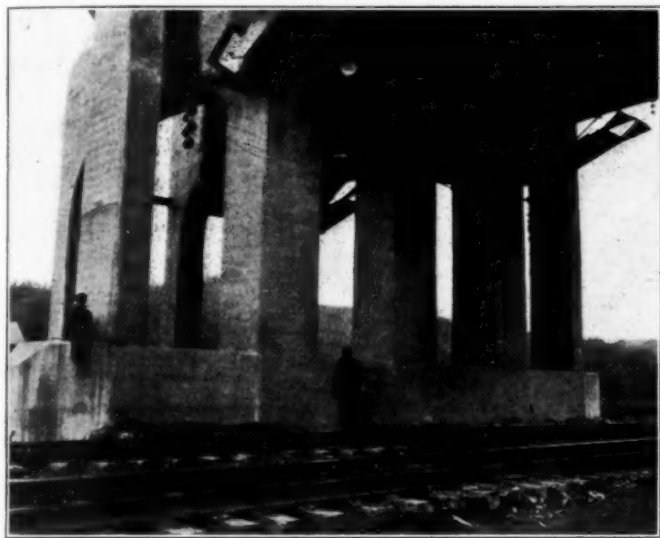
This coaling station is built entirely of cast-in-place reinforced concrete from the foundation to the peak of

the wet sand to a separate storage bin having a capacity of 75 tons of sand.

At the bottom of the 2,000-ton bin provision has been made for the installation of a 30-in. by 30-in. Jeffrey single roll coal crusher and the addition of a short belt conveyor for conveying crushed mine run coal to one of the track hoppers for re-elevating in the event that more lump coal may be on hand than is required and it is desired to crush additional stoker coal from the lump coal bin. When this feature is completed the coal will flow to the crusher by gravity and the recrushing and handling features will be automatic throughout.

The three-ton buckets are connected by one-inch Leschen steel hoisting cables to two automatic electric hoisting drums located on the ground level in the operator's hoist house. The hoists operate automatically, the 40-hp. General Electric motors being controlled by a Cutler-Hammer automatic controller. The buckets are counterbalanced with 14,000-lb. concrete counterweights operating on the back or roof of the elevating tower.

The electric hoists are equipped with the necessary precautionary features which automatically prevent overwind



The Presence of the Men Affords a Conception of the Massiveness of the Substructure

the roof which is 135 ft. above the base of rail of the coaling tracks. The main feature of the station is an elevated circular reinforced concrete storage bin 55 ft. in diameter which has a storage capacity of 2,000 tons of bituminous coal and is arranged to deliver coal simultaneously to locomotives on six tracks.

Coal is received on two tracks located at one side of the station through the agency of duplicate track hoppers into which coal may be dumped from two cars at one time. These hoppers deliver coal to two three-ton elevating buckets by means of Schraeder measuring feeders which load the buckets to capacity automatically. There are two separate and distinct elevating units with a combined hoisting capacity of 150 tons of coal per hour, so arranged that either elevator may be used alone. This provides for the contingency of accident or breakdown to either machine, which might be caused by car couplers, stray iron or other foreign objects being dumped with the coal. Green sand is also dumped from cars by gravity and elevated in the same three-ton buckets. The buckets roll up the inclined tower on 4-in. by 4-in. by ½-in. double angle-iron tracks.

At the dump house overhead the buckets discharge automatically into a steel hopper which is so arranged that the mine run coal may flow direct to the storage bins, or by the throwing of a by-pass gate, may pass over inclined steel bar screens, the oversize lumps gravitating into a separate compartment for the storage of lump coal, which is available for delivery to any one of the six tracks. The coal passing through the screen is stoker coal which goes direct to the stoker bin from which it may also be delivered to locomotives on any of the coaling tracks. For the delivery of sand a second by-pass gate is provided to direct



A General View of the New Coaling Station

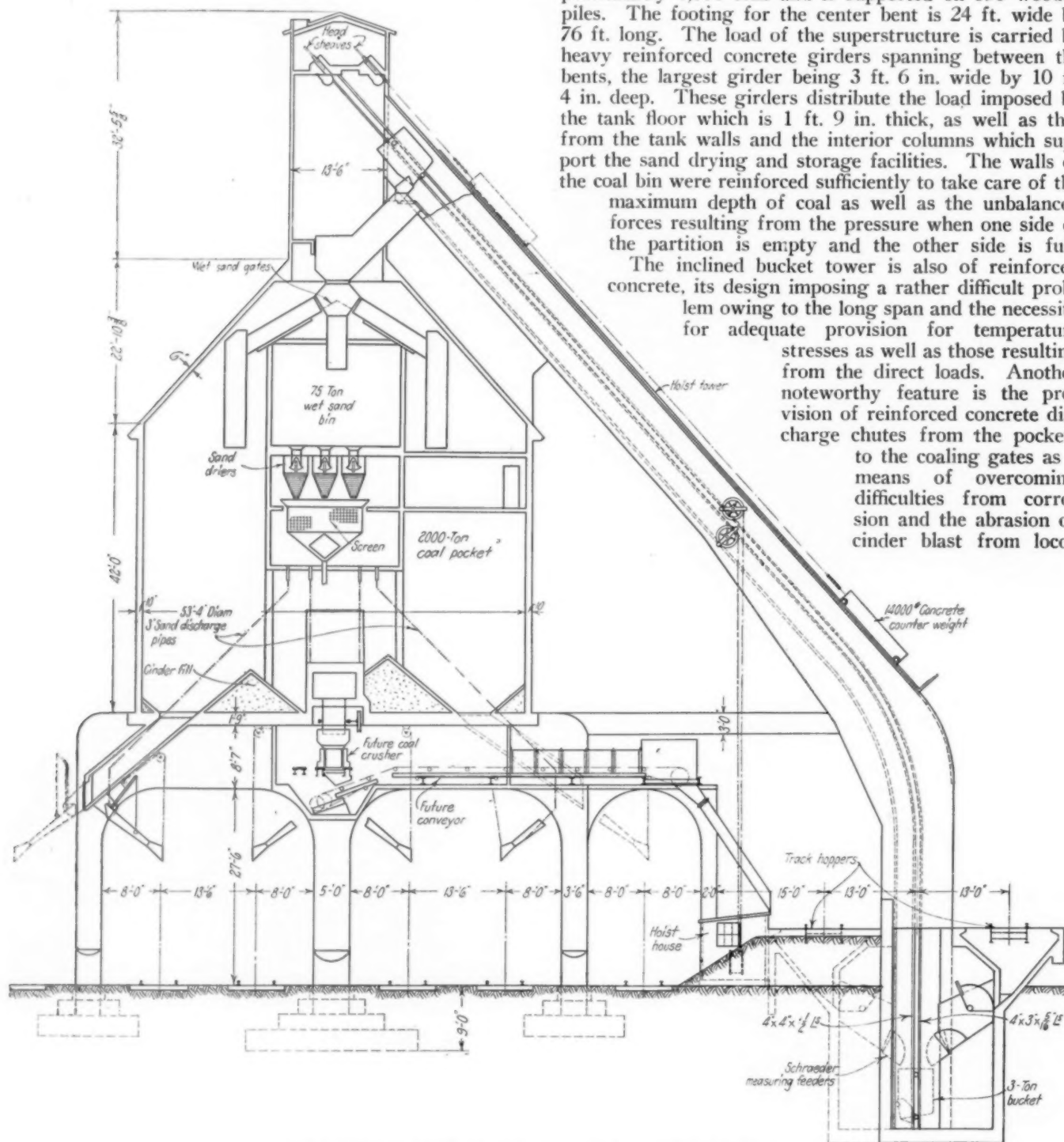
of the elevating buckets and damage to the machinery in the event that any of the control mechanism should fail. Provision is also made for bringing the machinery to rest automatically in the event that slack cable should accumulate in the hoist house. General Electric solenoid brakes are provided to insure the holding of the bucket-load at any point in the hoisting tower if the current should be cut off.

The sand-handling features are of a new type, being a system recently developed by the builders which entirely eliminates the use of sand blast piping and compressed air in the elevation of dry sand. The wet sand bin is equipped with cast iron undercut gates which deliver sand to three

Beamer steam sand dryers suspended directly below. These dryers will dry the sand at the rate of 24 tons in 24 hours. Under the dryers is a large hopper screen which automatically screens out pebbles, chips and small pieces of coal and this refuse gravitates through a cast iron pipe to a refuse pile on the ground. The dry sand

Entirely aside from the mechanical features, this plant is noteworthy from the structural standpoint. The tank and its superstructure are supported on three reinforced concrete bents, comprising a total of 11 columns, the largest of which measures 5 ft. by 5½ ft. in section. The entire structure, including the column footings, weighs approximately 5,000 tons and is supported on 390 wooden piles. The footing for the center bent is 24 ft. wide by 76 ft. long. The load of the superstructure is carried by heavy reinforced concrete girders spanning between the bents, the largest girder being 3 ft. 6 in. wide by 10 ft. 4 in. deep. These girders distribute the load imposed by the tank floor which is 1 ft. 9 in. thick, as well as that from the tank walls and the interior columns which support the sand drying and storage facilities. The walls of the coal bin were reinforced sufficiently to take care of the maximum depth of coal as well as the unbalanced forces resulting from the pressure when one side of the partition is empty and the other side is full.

The inclined bucket tower is also of reinforced concrete, its design imposing a rather difficult problem owing to the long span and the necessity for adequate provision for temperature stresses as well as those resulting from the direct loads. Another noteworthy feature is the provision of reinforced concrete discharge chutes from the pockets to the coaling gates as a means of overcoming difficulties from corrosion and the abrasion of cinder blast from loco-



The Sanding Facilities Are Inclosed in the Coal Pocket

passes through the screen under the dryer to a 20-ton storage bin from which it flows by gravity to six enclosed moisture-proof undercut sand valves and telescoping spouts for supplying sand to engines on the six tracks. Substantial drip pans are provided to deflect the accumulated moisture in the wet sand at such times as the dryers are not in operation so that it cannot moisten the dry sand in the bin below.

motive stacks. All bolts were made removable by setting cast iron inserts in the concrete.

The Roberts & Schaefer Company, Chicago, designed and built the plant by contract under the direction of Charles Corwin, its general superintendent, and J. P. Copp, local superintendent. The work was under the jurisdiction of W. P. Wiltsee, chief engineer of the N. & W., and F. P. Turner, principal assistant engineer.

Santa Fe Has Record-Breaking Year

Carries heaviest freight traffic—Earns \$15.46 per share on stock and earns interest 4½ times

THE annual report of the Atchison, Topeka & Santa Fe for 1924, made public on Tuesday, proves to be better than was expected, which is saying a great deal. It was, of course, known before the report was issued that net railway operating income for the year would exceed that of 1923, but it was not believed that the corporate net income available for dividends would be quite as large as it was in the year preceding. The final figures show, however, that the net income in 1924 was greater, rather than less, than that of 1923. It totaled \$42,151,807, comparing with \$42,087,801 in 1923. The 1924 net was equivalent after allowance for dividends on the preferred stock to \$15.46 per share on the common stock as compared with earnings per share in 1923 of \$15.43. The year 1924 was the sixth year in succession in which dividends on the common stock were earned at least twice, and the eighth year in the past nine in which that enviable result has been secured. In 1924, interest charges were earned 4.75 times, in 1923, 4.71 times. The net available for dividends in 1924 was the largest in the company's history with the exception of a single year, 1919, the second year of federal control in which there was net income of \$43,098,658 made possible by special accruals of outside income totaling no less than \$15,000,000 and comparing with but 4 million in 1918 or with 7½ million in 1924.

Capital Improvements

The Santa Fe in 1924 had the largest freight business in its history, as expressed in either revenue tons or revenue ton-miles. The net railway operating income similarly was the largest in the company's history and, as noted, the corporate net income the largest with a single exception, and that exception characterized by special conditions. These are, in the main, the distinguishing features of the Santa Fe's 1924 annual report. There is, however, one other feature, namely, the large sums spent for capital improvement. The expenditures for additions and betterments totaled \$45,940,825, divided about evenly between road and equipment. In 1923, such expenditures totaled \$50,508,413. The capital expenditures in either year lacked only a small percentage of being double the expenditures in any previous year or equal to those of any two preceding years. The size of the program is further indicated by the fact that annual dividends on the preferred and common stocks combined are approximately \$20,000,000. The Santa Fe has been noted for putting back into the property slightly more than one dollar in improvements for each dollar paid out to stockholders in dividends. For the past two years, however, the proportion has not been dollar for dollar but more than two dollars for one. It is interesting, in this connection, to observe that the increase in the Santa Fe's investment in road and equipment in the five years from January 1, 1920, to December 31, 1924, has totaled \$148,764,374, equivalent to \$64 per share on the common stock outstanding at the present time. The increase in the investment in road and equipment has approximated 30 millions annually, equivalent to over \$12 per share.

Revenues and Expenses

There follows a summary of the Santa Fe's income account for 1924 as compared with 1923:

	1924	1923
Average mileage operated	11,905	11,757
Railway operating revenues	\$235,410,952	\$238,683,735
Maintenance of way	\$36,713,084	\$33,621,546
Maintenance of equipment	52,780,856	57,605,367
Transportation	72,599,043	73,590,674
Total operating expenses	\$170,314,808	\$173,076,268
Net revenue from operations	\$65,096,144	\$65,607,467
Railway tax accruals	17,730,961	20,316,491
Railway operating income	\$47,299,098	\$45,178,789
Equipment rents—Net Cr.	\$551,912	\$1,760,909
Joint facility rents—Net Dr.	567,731	577,426
Net railway operating income	\$47,283,279	\$46,362,272
Other income	6,653,870	7,504,269
Gross income	53,937,149	53,866,541
Interest on bonds	\$11,247,995	\$11,323,743
Net income	\$42,151,807	\$42,087,801
Disposition of net income:		
Divs. on pref. stock, 5 per cent.	\$6,208,640	\$6,208,685
Divs. on comm. stock	14,525,594	13,909,245
Surplus for year carried to profit and loss ..	\$21,372,359	\$21,925,078

*6 per cent paid from 1923 income; 6¼ per cent from 1924 income.

The distinguishing feature of the foregoing table is the comparatively small amount of change in the one year as compared with the other. This is a characteristic of Santa Fe operations. It results principally from the varying character of the parts of the widespread territory that the system serves and the unusually well diversified nature of its traffic. The total operating revenues in 1924 were one per cent less than in 1923. As has already been noted, the road moved more freight traffic than in any preceding year, the net ton-miles in 1924 showing an increase of 4.59 per cent over 1923. The freight revenues in 1924 were slightly larger than in 1923 but the passenger revenues were somewhat less, due to a decrease of 6.45 per cent in revenue passengers one mile. The Santa Fe receives about one-third of its total operating revenues from passenger train operations. There was a decrease also of one per cent in operating expenses. A decrease of 8 per cent in maintenance of equipment and of about one per cent in transportation were practically compensated for by an increase of 9 per cent in maintenance of way. The decrease in maintenance of equipment expenses resulted because expenses charged to that account in 1923 were high due to the cost of work incident to catching up on the effects of the shopmen's strike of 1922. One of the reasons for the decrease in transportation expenses was that whereas there was an increase of 4.95 per cent in ton-miles there was a decrease of 4.96 per cent in freight train-miles.

It will be noted that there was a substantial decrease in the credit equipment rent balance. There was also a substantial decrease in taxes, the total paid for taxes, \$17,730,961, being \$2,585,530 less than in 1923. The usual increase was shown in state and local taxes but federal taxes were \$3,708,517 less which resulted, presumably, from the fact that in 1923 the Santa Fe reported on its tax forms a considerable portion of the net proceeds of its settlement with the government. However, the change in operating revenues and operating expenses was so slight that it was largely due to this decrease in taxes that the net operating income in 1924 was slightly in excess of that of 1923.

It is probably true that there is no other railway prop-

erty in the United States which stands in quite the enviable position of the Atchison, Topeka & Santa Fe. The road has so many characteristics of excellence that it is difficult to select from them in the space of a short article. Among these features are its wide spread territory, its diversified traffic, the manner in which the system is well knit together with a comparative absence of non-lucrative branch lines, the manner in which the road has been able to find the money to keep its plant built up ahead of the

being the Milwaukee—which has a line of its own from Chicago to the Pacific coast. This line is now double-tracked practically its entire length except for those portions where paralleling lines have made such thus far unnecessary. This is the case notably with reference to the mileage between, say, Hutchinson, Kan., and Belen, N. Mex., between which points the Santa Fe has two lines, one via La Junta, Col., and the other via Clovis, Tex., West of Barstow the Santa Fe similarly has two lines,

ATCHISON, TOPEKA & SANTA FE—TRAFFIC AND EARNINGS, SELECTED ITEMS, 1914 TO 1924

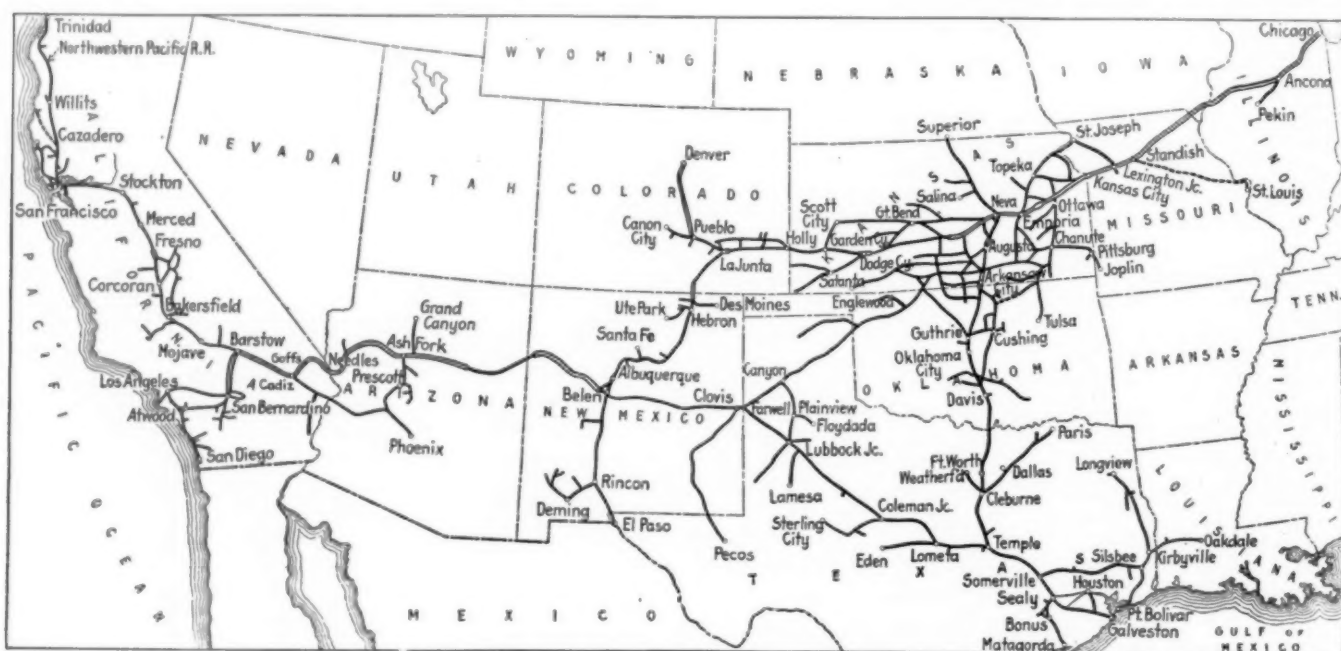
Year ended	Mileage	Revenue tons carried	Revenue tons, miles	Average haul	Revenue per ton mile, cents	Average train load	Average car load	Total operating revenues	Operating expenses and taxes	Net railway operating income	Non-operating income	Net corporate income
June 30												
1914.....	10,961	25,034,240	7,316,270,000	292	1.007	420	18.75	\$111,109,770	\$78,994,919	\$32,043,000	\$1,362,000	\$20,183,965
1915.....	11,136	26,093,880	8,263,466,000	317	0.974	442	19.71	111,665,587	81,588,870	34,852,000	2,303,000	24,130,862
1916.....	11,271	31,193,939	9,845,097,000	316	0.929	468	19.96	133,762,392	89,941,326	43,043,000	2,575,000	32,579,735
1917.....	11,270	35,277,697	12,058,609,000	342	0.927	498	20.66	156,179,121	106,204,203	.....	.....	39,209,073
Year ended Dec. 31												
1917.....	11,284	35,619,001	12,905,999,000	362	0.906	520	21.39	165,529,519	117,155,239	47,220,000	3,172,000	38,185,547
1918.....	11,459	.....	.....	.....	.....	.....	.....	187,658,223	146,961,821	44,206,000	4,311,000	28,348,433
1919.....	11,500	31,811,576	11,931,108,000	375	1.213	557	22.23	209,500,004	169,153,558	42,008,000	15,100,000	43,098,658
1920.....	11,584	36,850,553	12,806,129,000	348	1.316	569	23.12	254,249,002	216,706,280	37,380,591	9,842,116	37,634,752
1921.....	11,678	29,059,538	10,375,038,000	357	1.544	538	22.12	228,925,070	188,054,184	41,268,307	5,293,888	39,331,662
1922.....	11,700	33,812,696	11,177,224,000	331	1.414	582	21.51	225,124,544	185,299,890	40,003,402	6,723,387	34,382,371
1923.....	11,782	39,683,682	12,323,632,000	311	1.350	588	21.31	238,683,735	193,392,759	46,362,272	2,594,269	42,087,801
1924.....	11,905	40,695,205	13,080,878,000	321	1.285	647	21.87	235,410,952	188,045,769	47,283,279	6,653,870	42,151,807

demands upon it for transportation service and the fact that it has been able to carry out the continuing extensive program of improvements without the necessity of increasing fixed charges. Much has been said, of course, about the fact that the income of the Santa Fe has gone back into the property and not, proportionately speaking, to its stockholders. The recent increase in the dividend rate from 6 per cent to 7 per cent was a slight recognition of this condition, and there has been much complaint in many quarters because, with its great prosperity, the

one in effect a double track line to Los Angeles and the other extending northward to San Francisco.

An important part of the Santa Fe System is the Gulf, Colorado & Santa Fe, which extends south through Oklahoma and Texas to Galveston. A connecting line from Temple, Tex., reaches the main line near Clovis. There are lines also to Denver, Col., to El Paso, Tex., to San Diego, Calif., etc.

In 1924, the system's traffic was divided as follows: Products of agriculture, 23 per cent; products of ani-



The Atchison, Topeka & Santa Fe

management has allowed stockholders participation to the extent of only an additional one per cent in place of some greater amount which, it is contended, would have been justified by the amount of earnings.

Mileage

The Santa Fe operates a total of 11,905 miles of line. It is one of only two transcontinental carriers—the other

being the Milwaukee—which has a line of its own from Chicago to the Pacific coast. This line is now double-tracked practically its entire length except for those portions where paralleling lines have made such thus far unnecessary. This is the case notably with reference to the mileage between, say, Hutchinson, Kan., and Belen, N. Mex., between which points the Santa Fe has two lines, one via La Junta, Col., and the other via Clovis, Tex., West of Barstow the Santa Fe similarly has two lines,

Pacific, the Santa Fe has been favored because it has had access to two very competitive oil areas, namely, the mid-continent fields and the newer developments in southern California. The traffic in petroleum is a comparatively new development. Even as recently as 1918, refined petroleum and its products, with the addition also of crude, constituted only 7 per cent of the system's traffic. This means, in its essentials, that the Santa Fe has benefited like the neighbors of its gulf line (the Katy, Frisco, etc.) from the remarkable expansion due to the oil developments of the Southwest.

An interesting recent development in connection with the Santa Fe's traffic has been the agricultural improvement of western Texas. This area, formerly devoted to grazing purposes, has, in recent years, been broken up into farms, principally in the form of 160-acre tracts. "This development," says Mr. Storey, in his annual report, "is especially marked along the main line from Texico to Lubbock and along the main line and branches from Canyon City south to Slaton, including the Lamesa branch.

This region had excellent grain and cotton crops in 1924 and thus far has been free from the boll weevil, with a reasonable prospect that it will continue so because of the high altitudes, sharp cold spells in winter, and dry climate. Cotton does well here and is the chief single factor in all this activity. Lying directly west of Lubbock is a territory comprising about one million acres, nearly all good agricultural land. To open this for settlement it is proposed to build during 1925 a line 65 miles long to a point near the western border of the state and with the great number of settlers now going into this region this line should prove a good feeder to the Atchison System."

Much has been made in many quarters of the remarkable manner in which America's largest public utility, namely, the American Telephone & Telegraph Company, anticipates the needs of the country for telephone service. Unfortunately, sometimes derogatory comparisons are made between the policy of the telephone company and that of some of the railroads. It is well to bear in mind in such comparisons as these that there are certain of the railroads that have excellent records with respect to keeping up with the needs of their territories. One of these is the Santa Fe. It was a commonplace statement before the war that the Santa Fe was built up to ten years ahead of its time. It has been thought that during the war and the period of federal control this ten year lead was substantially reduced but it is apparent from the enormous sums spent for capital improvement in the past two years that the former enviable situation has been restored. It was noted above that the increase in the Santa Fe's investment in road and equipment in the five years ending December 31, 1924, was approximately \$30,000,000 annually and that in 1923 the amount spent for additions and betterments was \$50,000,000; in 1924, \$45,000,000.

Of the improvements in recent years, the most important has been the double tracking of the main line. A substantial improvement was made in this respect in 1924. The mileage of second track at the end of the year totaled 1,596, being 104 miles more than at the beginning. There are only 120 miles of single track line remaining, except where there are paralleling lines, between Chicago and Los Angeles.

Capital Improvements Paid For from Income

All of the improvement program that the Santa Fe has carried on for the past several years has been paid for without the issuance of a bond or equipment trust certificate. As a matter of fact, the Santa Fe now has outstanding \$275,933,158 of funded debt. On this, there are

no important maturities until 1958 and \$200,000,000 does not mature until 1995. The amount of funded debt has decreased year by year. In 1912, for instance, it amounted to \$342,645,000.

Decrease in Funded Debt

Outside of the fact that the company has carried on its financing by means of earnings, the reason for the decrease in funded debt has been largely the exchange of common stock for convertible bonds. At the end of 1924, the Santa Fe's funded debt constituted but 44 per cent of its total capitalization. This funded debt has an average rate of interest of but 4.08 per cent. The interest charges of 1924 totaled \$11,247,995, the smallest amount paid for this purpose since 1906. At the present time the Santa Fe has outstanding \$124,172,800 preferred stock and \$232,409,500 common. Stockholders have approved, and the approval likewise of the Interstate Commerce Commission has been obtained, for an increase in capital stock of \$100,000,000, but thus far there has been no indication as to the use to which this authority may be put. The Santa Fe continues in an unusually strong cash position. Its cash balance as of December 31, 1924, totaled \$35,558,426, which is about the normal amount. However, of late the company has been reducing its so-called other investments. These were built up immediately following the period of federal control and totaled in 1922 \$44,838,738 but the amount was reduced by \$10,000,000 in 1923 and by an additional amount in 1924 so that the balance at the end of the year was but \$15,045,712. These other investments are largely United States Government bonds.

The final indication of Santa Fe strength is the fact that on December 31, 1924, it had a corporate surplus of \$274,791,025 and that this had increased from \$106,190,657 in a year as recent as 1916. The amount was made up in the form of \$87,014,624 additions to property through income and surplus and a profit and loss balance of \$187,419,332.

Oil Properties

Much has been made during the past year of the Santa Fe's oil properties. There was for a time something which is very rare in connection with Santa Fe stock, namely, a speculative interest developed as the result of the discussion of the assets embodied in this property, but this was largely discounted when it was explained by Mr. Storey that while it was true that the Chanslor Canfield Midway Oil Company and the Coline Oil Company sold a certain portion of their output commercially, it was also true that the total oil production of the Santa Fe subsidiaries was equal only to about two-thirds of the road's total consumption of fuel oil, one-half of its locomotives being oil burners. It is true, nevertheless, that the Chanslor Canfield Midway Oil Company, which is owned entirely by the Santa Fe, is a very prosperous company and pays fairly substantial dividends which accrue to the railroad in the form of other income.

Notwithstanding this fact, the management apparently prefers to consider the oil subsidiaries rather in the nature of a protection to the company in the matter of fuel supply.

LOSS AND DAMAGE freight claim payments on the Missouri Pacific last year were \$990,379, the ratio of claim payments to gross freight revenue being 1.03 per cent, the lowest in the history of the company. The reduction in claim payments as compared with 1923 was \$191,341, a reduction in the ratio to the gross freight revenue of 0.35 per cent.

General News Department

The Interstate Commerce Commission has authorized the Chicago, Indianapolis & Louisville to install automatic train control upon its air line between Hammond and Monon, Ind., in lieu of the installation required in the commission's order of June 13, 1922, but has denied the company's petition that the order of January 14, 1924, requiring an installation upon another portion of its line be vacated.

The Gulf, Mobile & Northern recently initiated a fuel saving contest for enginemen and firemen which has developed considerable enthusiasm, and promises to result in greatly increased interest in fuel conservation. It is expected that fuel saving records will be broken. The contest extends through the month of April and the winners will be sent at the expense of the company to the annual convention of the International Railway Fuel Association, at Chicago on May 26.

The railroad law of New York was amended by the legislature, at its recent session, by the addition to section 148 of a clause authorizing railroad companies not only to lease but to sell their property. Another law, passed at the same session of the legislature, Chapter 572, adds a new section defining the rights of dissenting stockholders when a railroad is consolidated, leased or sold. The law prescribes the method of appraisal of the value of the stock.

The American Railway Association is to hold a special session at the Blackstone Hotel, Chicago, on Friday, May 15, beginning at 10 a. m., Central time. Secretary H. J. Forster requests members to advise whether or not they will be represented. The Car Service Division will review transportation conditions, in a report which will be sent in advance to members, and the board of directors will review the doings of the association since the last general meeting.

The United States government has filed suit in the Federal District Court of Los Angeles, Cal., against the Southern Pacific, the Southern Pacific Land Company and two New York trust companies to recover 400 acres of land near Goffs, Cal., which was granted to the railroad in 1866 as agricultural land and which since, it is claimed, has been identified as mineral bearing land. The land is alleged to contain gold, silver, tungsten, iron and other minerals and its potential value is placed at \$3,000,000.

Signal Section Goes to West Baden

West Baden Springs, Indiana, has been selected as the place for the fall meeting of the Signal Section of the American Railway Association; and the time is September 29 and 30 and October 1.

Boise on the Main Line

The secondary main line of the Union Pacific (Oregon Short Line) from Orchard, Idaho, via Boise to Nampa, was completed and placed in operation on April 16. Boise, the capital of Idaho, is now for the first time on the main line of a railway.

Favors New Port for Hudson Bay Railway

"It is the only road in North America that has not a bonded debt and that has no dangerous level crossings," said William R. Motherwell, Minister of Agriculture, speaking in the Canadian House of Commons last week in favor of the early completion of the Hudson Bay Railway and in favor of making Fort Churchill, instead of Port Nelson, the Bay terminus of the road. "An engineer," he said, "would not have much of a job opening up Churchill. The Lord himself made Churchill and you cannot improve upon His handiwork, but no such provision was made at Nelson and an engineer had opportunities there. Here is Nelson

exposed to the sea, an uncertain channel, better, it is true, than we thought it was a few years ago. The season opens up a little earlier at Nelson, but there are low tides, great mud flats, with a channel away off from dry land, with half a mile of steel trestling to get to it, quite a considerable quantity of dump to get to the steel trestling, and an artificial island at the end of that. Imagine that!"

New York Central Delegates to London Congress

The New York Central Lines will be represented at the International Railway Congress in London in June by the following officers: G. A. Harwood, vice-president in charge of improvements and development; F. H. Hardin, chief engineer of motive power and rolling stock; and C. F. Smith, general superintendent of passenger transportation. The names of delegates chosen so far by other railroads were published in the *Railway Age* of February 28, 1925, page 528, and March 28, 1925, page 849.

Railroad Pays Tax on Telegrams

The legality of a tax of \$15,000 levied by the federal government against the Missouri Pacific for telegraph messages sent over the wires of the Western Union Telegraph Company between August, 1920, and January, 1923, was established by Judge Faris of the United States District Court in St. Louis on April 4. The tax had been paid by the railroad under protest and refund was sought on the ground that the railway had a reciprocal agreement with the telegraph company whereby transportation over the railway was exchanged for telegraph service. Judge Faris ruled that the railroad had received the equivalent of cash for transportation and should pay the usual tax of five cents on messages up to 50 words and 10 cents on longer messages.

C. N. R. Debt Not Included in Dominion Indebtedness Figures

Canadian National Railway bonds, guaranteed by the Dominion government and not included in the estimated national debt, were the subject of information tabled in the House of Commons at Ottawa. The government figures show that these bond issues, in the different fiscal years, were as follows: 1920-21, \$50,000,000; 1921-22, \$61,000,000; 1922-23, none; 1923-24, \$50,000,000. In addition to these, an equipment issue of \$22,500,000 in 1923-24 was guaranteed by the government. The proceeds of guaranteed bonds and government loans in cash utilized by the Canadian National for redemption of debt due to the public were as follows: 1920-21, \$56,382,626.17; 1921-22, \$48,871,443.41; 1922-23, \$25,275,902.04; 1923-24, \$11,469,369.69.

Marked Progress in Paving Brick Standardization

A reduction from 66 to 4 recognized types and sizes of vitrified paving brick is the simplification record of the paving brick industry in the short period of four years, as carried out by the Permanent Committee on Simplification of Varieties and Standards of Vitrified Paving Brick of the United States Department of Commerce. At a meeting of the committee held at Washington, D. C., on March 20, one of the five remaining types and sizes of brick was eliminated, thus cutting down the recognized list to four.

Following are the recognized types and sizes:

	Depth	Width	Length
	(As usually laid)		
Plain wire-cut brick.....	3 in.	by 4 in.	by 8½ in.
(Vertical Fiber Lugless).....	3½ in.	by 4 in.	by 8½ in.
Wire-cut brick (Dunn).....	4 in.	by 3½ in.	by 8½ in.
Repressed lug brick.....	4 in.	by 3½ in.	by 8½ in.

Of the total 1924 shipments, 82.1 per cent were in the four types and sizes now recognized by the committee. The most marked growth of any special variety outside of the recognized list was

that of the 2½-in. by 4-in. by 8½-in. vertical fibre (plain wire-cut) brick. This size and type of brick increased from 2.2 per cent of the total shipments in 1922 to 4.4 per cent of the shipments in 1924. It was the judgment of the committee that the experience during 1925 would in all probability determine the value of this thinner brick and that including it in the list of recognized types and sizes could be given careful consideration at the next meeting of the committee in 1926.

State May Take Over Michigan Road

Both houses of the legislature of the state of Michigan have passed a bill providing for the acquisition of the Detroit, Grand Haven & Milwaukee, which is now owned by the Grand Trunk, and for its operation by the state. This proposal has arisen out of a tax dispute between the road and the state. Under the original charter of the railway it was provided that taxes of the company should not be assessed on the valuation of the property but should equal 1 per cent annually on the paid-in capital stock. Although, as the state claims, the cost of construction was \$13,437,985, the paid-in capital stock now equals only \$2,517,140.

Thus the taxes of the railway for 1923 were \$25,171 instead of the \$213,709 that they would have been if assessment had been made on the valuation of \$7,500,000. The right to purchase the road is claimed through a provision in the original charter that the state should have the right at any time after the expiration of 20 years from the completion of the railway to purchase and hold it for the use of the state, at a price not exceeding the cost of construction and 14 per cent.

The bill having been passed by both houses the next move of the state will be to appoint a committee to make all arrangements for the purchase.

Contracts for Air Mail Service

Postmaster General New has issued regulations governing the letting of contracts to transport mail by air, carrying out recent legislation. It is expected that the operation of the new law will place America on a par with commercial aviation abroad which in most cases is heavily subsidized by the government. Contractors on air mail routes will be permitted to transport passengers, express packages, and freight. The act authorizes postage rates

OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM ROADS IN THE UNITED STATES
(FOR 192 STEAM ROADS, INCLUDING 16 SWITCHING AND TERMINAL COMPANIES)

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924
	Average number of miles operated									
Revenues:	236,637.54	236,023.51	59,490.15	59,516.01	5,501.54	5,498.98	38,505.45	38,337.90	133,140.40	132,670.62
Freight	\$336,799,840	\$252,692,475	\$152,452,116	\$162,068,242	\$16,215,573	\$16,135,017	\$48,811,699	\$50,178,595	\$119,320,452	\$124,310,621
Passenger	77,566,197	83,394,858	36,645,620	38,564,441	1,773,498	1,869,272	13,131,680	13,146,937	26,015,399	29,814,208
Mail	7,678,383	7,758,573	2,886,434	2,922,545	214,326	193,250	1,106,749	1,096,803	3,470,874	3,545,975
Express	9,231,783	11,230,442	3,903,332	5,039,785	178,807	233,672	1,568,283	1,525,716	3,581,361	4,431,269
All other transportation	14,490,517	14,850,886	8,452,985	8,552,380	168,340	160,800	919,249	887,820	4,949,943	5,249,886
Incidental	8,628,699	8,708,949	4,278,424	4,422,474	289,608	304,037	1,288,107	1,109,590	2,772,560	2,872,848
Joint facility—Cr.	797,684	1,032,267	347,078	329,877	15,915	12,414	125,641	124,809	309,050	565,167
Joint facility—Dr.	197,004	214,483	93,476	114,290	1,702	1,722	36,315	31,791	65,511	66,680
Ry. operating revenues	454,996,099	479,453,967	208,872,513	221,785,454	18,854,365	18,906,740	66,915,093	68,038,479	160,354,128	170,723,294
Expenses:										
Maintenance of way and structures	54,923,944	54,419,439	23,728,380	22,952,938	2,754,508	2,525,800	8,682,708	8,501,576	19,758,348	20,439,125
Maintenance of equip't	101,491,536	107,006,053	49,343,229	52,287,960	4,263,274	4,790,273	12,316,301	13,048,560	35,568,732	36,879,260
Traffic	8,241,355	7,922,077	3,056,831	2,983,231	221,472	196,206	1,583,207	1,448,773	3,379,845	3,293,867
Transportation	173,731,479	188,782,705	83,131,883	91,532,707	5,650,730	6,410,190	23,573,799	24,688,365	61,375,067	66,151,443
Miscellaneous op'r'tions	4,052,697	3,902,037	1,877,768	1,905,884	92,130	83,938	619,146	442,769	1,463,653	1,469,446
General	13,916,181	13,691,626	6,208,269	6,116,555	446,058	402,436	1,791,124	1,787,510	5,470,730	5,385,125
Transportation for investment—Cr.	802,433	807,831	140,858	115,206	22,504	17,015	139,740	103,398	499,331	572,212
Ry. op'r'ting expenses	355,554,759	374,916,106	167,205,502	177,664,069	13,405,668	14,391,828	48,426,545	49,814,155	126,517,044	133,046,054
Net revenue from railway operations	99,441,340	104,537,861	41,667,011	44,121,385	5,448,697	4,514,912	18,488,548	18,224,324	33,837,084	37,677,240
Railway tax accruals	26,953,787	25,630,692	10,105,135	9,857,486	1,208,136	1,158,677	3,922,127	3,504,938	11,718,389	11,109,591
Uncollectible ry. revenues	126,273	213,006	38,878	74,112	14,776	2,194	17,069	10,925	55,550	125,775
Ry. operating income	72,361,280	78,694,163	31,522,998	34,189,787	4,225,785	3,354,041	14,549,352	14,708,461	22,063,145	26,441,874
Eq't't rents—Dr. balance	5,900,636	5,564,828	3,143,579	3,667,305	4,456,494	4,364,065	985,879	574,820	2,227,672	1,686,768
Joint facility rent—Dr. balance	1,540,434	1,524,185	679,352	654,181	106,801	103,255	41,820	96,343	712,461	670,406
Net railway operating income	64,920,210	71,605,150	27,700,067	29,868,301	4,575,478	3,614,851	13,521,653	14,037,298	19,123,012	24,084,700
Ratio of expenses to revenues (per cent)	78.14	78.20	80.05	80.11	71.10	76.12	72.37	73.21	78.90	77.93

FOR TWO MONTHS ENDED WITH FEBRUARY, 1925 AND 1924										
Average number of miles operated	236,601.07	236,027.32	59,491.07	59,516.96	5,501.54	5,498.98	38,490.50	38,338.89	133,117.96	132,672.49
Revenues:										
Freight	\$687,401,274	\$686,211,960	\$306,842,600	\$314,163,513	\$33,525,372	\$31,223,207	\$97,434,376	\$96,806,659	\$249,598,926	\$244,018,581
Passenger	166,230,100	175,121,282	79,057,681	80,836,439	3,784,366	3,966,966	27,395,756	27,452,223	55,992,297	62,865,660
Mail	15,785,674	15,665,025	5,981,867	5,967,024	431,245	384,929	2,271,985	2,225,604	7,100,577	7,087,468
Express	19,996,374	21,708,700	9,007,657	9,646,301	475,162	469,800	3,045,098	2,951,865	7,468,457	8,640,734
All other transportation	30,338,869	29,756,679	17,516,120	17,113,474	348,234	320,841	1,822,450	1,731,374	10,652,065	10,590,990
Incidental	18,626,620	18,387,999	9,283,270	9,393,166	625,100	645,255	2,671,234	2,267,049	6,047,016	6,082,529
Joint facility—Cr.	1,791,751	2,114,015	834,152	714,015	31,132	30,026	250,155	267,812	676,312	1,102,162
Joint facility—Dr.	418,551	422,280	201,010	198,971	3,660	3,716	66,111	62,705	147,770	156,888
Ry. operating revenues	939,752,111	948,543,380	428,322,337	437,634,961	39,216,951	37,037,302	134,824,943	133,639,881	337,387,880	340,231,236
Expenses:										
Maintenance of way and structures	111,894,779	109,769,491	49,137,607	46,756,290	5,280,645	4,835,087	17,798,991	17,141,053	39,677,536	41,037,061
Maintenance of equip't	209,844,361	217,337,259	101,661,304	105,862,585	9,154,828	9,469,249	25,946,061	26,813,908	73,082,168	75,191,517
Traffic	16,741,086	16,015,601	6,162,718	6,014,683	444,127	399,205	3,130,857	2,987,860	7,003,384	6,613,853
Transportation	365,496,687	382,637,298	172,842,237	183,157,841	11,927,833	12,852,449	48,868,313	50,345,306	131,858,304	136,281,702
Miscellaneous op'r'tions	8,406,530	8,115,227	4,042,669	3,956,766	179,539	165,636	1,167,874	890,340	3,016,448	3,102,485
General	28,356,903	28,080,217	12,629,942	12,500,246	915,474	821,623	3,652,706	3,647,439	11,158,781	11,110,909
Transportation for investment—Cr.	1,452,101	1,880,986	235,959	235,583	43,487	31,712	282,195	214,937	890,460	1,398,754
Ry. op'r'ting expenses	739,288,245	760,074,107	346,240,518	358,012,828	27,858,959	28,511,537	100,282,607	101,610,969	264,906,161	271,938,773
Net revenue from railway operations	200,463,866	188,469,273	82,081,819	79,622,133	11,357,992	8,525,765	34,542,336	32,028,912	72,481,719	68,292,463
Railway tax accruals	54,256,509	51,327,818	20,730,011	19,986,038	2,435,445	2,315,385	7,667,144	6,692,475	23,423,909	22,333,920
Uncollectible ry. revenues	271,202	369,783	116,284	146,486	18,412	3,544	30,870	28,466	105,636	191,287
Ry. operating income	145,936,155	136,771,672	61,235,524	59,489,609	8,904,135	6,206,836	26,844,322	25,307,971	48,952,174	45,767,256
Eq't't rents—Dr. balance	11,959,817	10,682,715	6,153,834	6,787,635	4,883,873	4,693,497	1,681,615	930,673	5,008,243	3,657,904
Joint facility rents—Dr. balance	3,230,372	3,079,112	1,444,578	1,380,099	199,920	212,704	189,432	211,794	1,396,442	1,274,515
Net railway operating income	130,745,966	123,009,845	53,637,112	51,321,875	9,588,390	6,687,629	24,973,275	24,165,504	42,547,489	40,834,837
Ratio of expenses to revenues (per cent)	78.72	80.13	80.84	81.81	71.04	76.98	74.38	76.03	78.52	79.93

a Includes \$2,724,360 sleeping and parlor car surcharge. b Includes \$2,605,712 sleeping and parlor car surcharge. d Deficit or other reverse items. c Includes \$5,702,212 sleeping and parlor car surcharge. e Includes \$5,367,626 sleeping and parlor car surcharge. (Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.)

of not less than 10 cents an ounce or fraction thereof and provides that not less than four-fifths of the total postage derived may be paid to the contractor.

The first step in bringing contract air mail routes into existence will originate with postmasters, who, by petition showing the need for the establishment of contract air mail routes between different cities, will call the attention of the Post Office Department to such routes. The Postmaster General after considering the petitions will advertise for bids in his discretion.

Contractors must be American citizens and corporations must furnish evidence to show that at least 75 per cent of the company's stock is American owned. Only aircraft manufactured in the United States may be used. Location of landing fields will be subject to approval by local postmasters and the Post Office Department. Each contractor must give a bond for not less than \$10,000 on each contract. Such land lighthouses, emergency landing fields, radio stations, other means of communication, and other aids to navigation as may be necessary for the proper navigating of aircraft of these contractors, must be provided for by the contractor.

Claims Hump Yard Efficiency Championship

The hump yard crew of the Illinois Central at Centralia, Ill., is not willing to agree that the performances of the hump crews of the Pennsylvania at Pitcairn, Pa., and of the Nashville terminal at Nashville, Tenn. (see *Railway Age*, March 28, page 851) are the ultimate in hump yard efficiency. The Illinois Central contenders handled 58,676 cars over the hump at Centralia within a two-months' period without damage to the cars or to their



freight. The members of the hump crew are shown in the accompanying photograph. Reading from left to right, the men in the photograph are: F. T. Gibbs (trainmaster), H. B. Oberst, I. R. Carter (yardmaster), G. F. Hails (yardmaster), C. F. Richardson, C. Rogers, Jesse Salee, Hugh Erwin, J. W. Berbaum, J. S. Foster, Fred Neibert, Joe Kilgore, C. R. Bousman, Anthony Zack, J. E. Combs, T. W. Phelps, P. A. Chandler, Roy Miller, Amos Sharp, A. P. Newcomb, E. P. Klamp, Otto Hasenfuss, O. Mosby, Buel Warren, A. C. Johnson, J. R. Copple, R. C. Thomas and Carl Allen.

North Western's Annual Meeting

An appeal to federal courts by northwestern railways for relief from present freight rates, if the Interstate Commerce Commission does not grant these roads permission to make increases, is being considered, according to a statement by Fred W. Sargent, vice-president and general counsel of the Chicago & North Western at the annual stockholders' meeting of that road in Chicago on April 14. Conferences between representatives of roads in the northwest have already been held, according to Mr. Sargent, but no definite agreement has been reached. "It is my opinion," said Mr. Sargent, "that present railroad rates, particularly in the western territory, are confiscatory, and that railroads could very easily obtain relief in federal courts on that ground. Obviously it would serve no purpose for the North Western to act alone; but unless some relief is granted by the various rate commissions, it is likely that such action may become necessary." In connection with his statement Mr. Sargent pointed out that the level of western rates is only 10 per cent above what it was before the rate increases in 1920. In the Western Trunk Line territory, he said, the average earnings were 1.12 cents per ton mile, compared with 1.36 cents in the southwest. For the United States as a whole, the average freight rate per ton per mile in 1924 was 51 per cent higher than in 1911, and 56 per cent higher than in 1917.

In the western district, however, the average in 1924 was only 29 per cent higher than in 1911, and 46 per cent higher than in 1917; while in the eastern district in 1924 it was 77 per cent higher than in 1911 and 70 per cent higher than in 1917. In the southern district the average in 1924 was 50 per cent higher than in 1917. W. H. Finley, president of the North Western, stressed the burden of increased wages and taxes and of the inequitable rate structure in the northwest. He said wage advances will add almost \$2,000,000 to the payroll in 1925. Taxes, he said, also are increasingly serious burdens; the North Western's payments on this account had increased from \$3,765,159 in 1913 to \$9,348,821 in 1924.

C. N. R.-C. P. R. Co-operation

Again Urged in Commons

How closely bound up is the railway problem in Canada with the nation's finances is shown by the fact that even on the Budget debate which has occupied the time of the House of Commons for two weeks there have been many extended references to the Canadian National and the need for economy and for elimination of needless duplication, as between that road and the Canadian Pacific. The question of the merger of those two roads, too, has received serious discussion. In addition to the speeches already quoted in the *Railway Age* on that subject a further contribution to the discussion was made last week by Andrew R. McMaster, a prominent Liberal member of the House from Montreal. As to the suggested amalgamation of the two roads, "That may be the proper thing to do," said Mr. McMaster, "I should be glad to study it, but I say meanwhile something has to be done, and I

make this suggestion: that Hon. George P. Graham, Minister of Railways and Canals, should say to the heads of our two great railway companies—'Gentlemen, cease useless competition, cease duplication of train services; find out what trains are paying you and then make arrangements to take off those that are not paying.' I think we could save in the tens and twenties of millions of dollars if that policy were adopted. It will not be easy to put into effect, for people do not like to co-operate when they have been competing strongly against each other. But they have got to do it. We cannot allow things to go on as they are, we must eliminate useless duplication."

An interjection came from Thomas W. Caldwell, a Progressive member from New Brunswick: "Would the Hon. gentleman go so far as to suggest that railway rates be reduced until the two companies are compelled to do what he suggests, if they will not do it otherwise?"

Mr. McMaster.—"I should not like to hold out the big stick before I had allowed the estimable Minister of Railways and Canals to emulate Sir Wilfrid Laurier and his sunny ways, which I think on the whole would be more likely to bring about the desired result than a display of force. But in all seriousness, the people of this country demand that economy be the watchword. That does not mean economy merely in little things, it means economy in big things and, I think, the line which I have suggested should be followed."

A lively speech on the railway question was also delivered last week by Roch Lanctot, one of the oldest French-Canadian members of the Canadian Parliament. His speech was largely devoted to proving that the Borden (Conservative) administration was more to blame for Canada's railway troubles today than was the Laurier (Liberal) government. "In 1917," said Mr. Lanctot, "the Borden government purchased the Canadian Northern. This bill was piloted by my hon. friend, the leader of the opposition (Mr. Meighen). Messrs. Mackenzie and Mann were well taken care of. After having undertaken to pay all the guarantees and

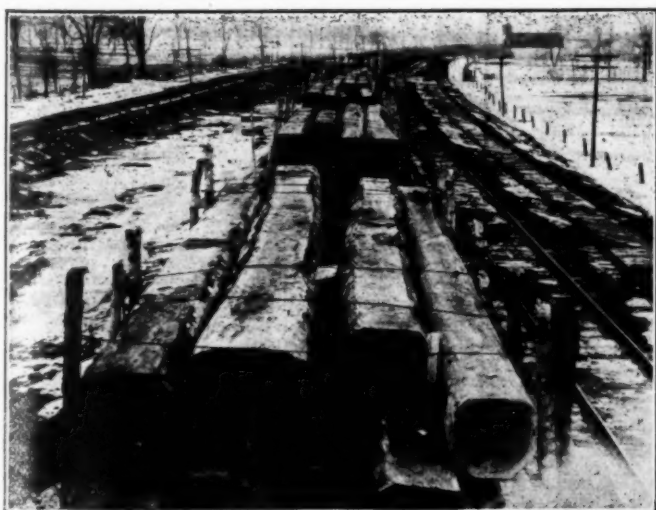
grants of the Dominion and provinces involved, in money and lands, all these said amounts, for the twenty-eight lines built by Mackenzie and Mann, costing more than \$500,000,000, the Borden government, at the time of the purchase of said railways, found the means of having \$10,000,000 paid in cash to compensate these gentlemen for their bankruptcy. This was equivalent to saying that they deserved the congratulations of parliament and the people of this country for having succeeded in placing a bankrupt railway upon the shoulders of the taxpayers of this country.

"I think, sir, that it would be difficult to find in this country other railway contractors who knew how to enrich themselves so well with an enterprise which became bankrupt. The people of Canada had no such luck.

"Owing to the fact that this purchase was made by the Borden government, the provinces were relieved from their guarantees to Mackenzie and Mann to the amount of over \$100,000,000, and, through this 1917 transaction, we, hailing from Quebec, have assumed a debt of not less than one-fourth of the above amount, \$25,000,000 to \$30,000,000 to pay for the blunders of the western provinces which had a very small population at that time.

"In 1920, we purchased the Grand Trunk Railway. We already had the Intercolonial, the Transcontinental, the Grand Trunk Pacific and other small lines in bankruptcy, and there are still some throughout the country that politicians offer to the president of our National railways so as to add to our railway system comprising 22,000 miles which we own at present, and upon which we lose fifty-six, sixty to eighty million dollars each year. And, all this without mentioning the new lines that we build here and there throughout the country. We have, sir, since the purchase of the Canadian Northern, in 1917, up to date, increased our railway debt by \$582,000,000; the interest, up to this day, on this amount comes to \$131,000,000; moreover we owe the public on these purchases nearly \$1,000,000,000. We owned paid up railways, previous to our first purchases, to the amount of nearly another \$1,000,000,000, and I have no fear of misleading the House and the country when I state that our railways cost us at least \$2,500,000,000. I wonder if this state of things can last much longer? Mr. Speaker, I have always been opposed to this folly of state-ownership and I am still more than ever against this unsound policy endorsed by too many of our colleagues in this House. . . ."

The New York State Barge Canal is to be opened for business on Wednesday, April 22. There has been no trouble from spring freshets, but there is still much snow in the Adirondacks, and a long continued rain might necessitate a change in the date of opening. The Champlain Canal is being repaired and will not be opened until sometime in May.



Four Train-Loads of this Virgin White Pine Were Recently Shipped Over the C. N. R. from Ontario—Destined for England for Use by British Admiralty

Traffic News

The Interstate Commerce Commission has suspended until August 31 pending investigation, schedules filed by the Chicago, Milwaukee & St. Paul, the Great Northern and the Northern Pacific proposing abolition of the export rates on grain from Montana to Pacific coast ports. The cancellation of the export rate would have resulted in increases effective April 23.

Freight Traffic in February

The volume of freight carried by the railroads during the first two months this year was the greatest ever handled by them during any corresponding period, according to reports compiled by the Bureau of Railway Economics.

In net ton miles, it amounted to 70,560,495,000, an increase of two-tenths of one per cent over the corresponding period in 1924, which marked the previous high record, and an increase of three-tenths of one per cent over the same period in 1923. It also was an increase of 3.9 per cent over the same period in 1920.

The Eastern district showed for the two months a decrease of six-tenths of one per cent, the Southern district a decrease of 0.5 per cent, and the Western district an increase of 1.6 per cent.

For the month of February alone freight traffic amounted to 33,552,280,000 net ton miles, a decrease of 2,427,790,000 or 6.7 per cent under the same month last year. This was, however, an increase of 2.8 per cent over February two years ago and 1.8 per cent over 1920. All districts reported decreases compared with February, 1924, the Eastern district showing a decrease of 7.2 per cent, the Southern 5.0 per cent and the Western 6.8 per cent.

The average daily movement per freight car in February was 26.9 miles, a decrease of three-fifths of a mile compared with the same month in 1924 but an increase of 2.1 miles above that for February, 1923. It was also an increase of two-fifths of a mile above the average for January this year.

The average load per freight car in February was 27.2 tons, two-fifths of a ton less than that for the same month last year and one ton less than in 1923. Compared with January, 1925, it was a decrease of four-fifths of a ton.

Conference of Shippers and Carriers in Chicago

A joint conference of the Chicago Shippers' Conference Association and the Chicago Claim Conference Committee on April 2 at the Hotel Sherman, Chicago, was attended by 200 shippers and railroad men. The success of a previous conference, held one year ago, was evidenced by the interest taken by both shippers and carriers and the co-operation that developed. That the carriers are effectively co-operating with shippers is demonstrated by a report made by a representative of the Chicago & North Western showing that two thirds of the loss and damage claims presented were adjusted on the day received, while several other western carriers reported that 85 per cent of the claims presented were adjusted in 15 days. The meeting was opened with addresses by H. E. Byram, receiver of the Chicago, Milwaukee & St. Paul, and C. T. Bradford, manager of the traffic department of the International Harvester Company.

The subjects treated were "The Salvage Value of Damaged Merchandise Returned to Shippers," by H. C. Kramer, traffic manager of the Wolff Manufacturing Corporation; "The Necessity of Furnishing Invoice on Parts Lost, Damaged or Destroyed," by W. J. M. Lahl, traffic manager of the American Seating Company; "Notations of Exceptions on Destination Freight Bills and Their Proper Verification," by J. D. Collier, traffic manager of the Kalman Steel Company; "Supporting Documents Necessary in Connection with Claims for Loss or Damage," by George A. Blair, general traffic manager of Wilson & Company; "Claims for Loss and Damage on Freight Loaded in Trap Cars by Industries," by R. M. Vowels, traffic manager of Montgomery, Ward & Company; "The Method of Arriving at Correct Measure of Legal Liability," by J. A. Brough, of Crane Company; "Claims for Shortage from Cars Loaded by Shippers," by Roy W. Campbell, manager of traffic of the Butler Paper Corporation, and "Concealed Loss and Damage," by H. D. Pixley, traffic manager of Carson, Pirie, Scott & Company.

Commission and Court News

Interstate Commerce Commission

The Commission has suspended from April 15 and later dates until August 13, the operation of schedules published in tariffs of various individual lines and of E. B. Boyd and B. T. Jones, agents, which propose to increase commodity rates on grain and grain products, carloads, from Chicago, Peoria, Ill., Cairo, Ill., St. Louis, Mo., and related points to Alliance and Ravenna, Ohio and other Ohio points rated with relation thereto.

"Recognition" of Canadian Lake Line

a Question for the Courts

The Interstate Commerce Commission has discontinued an investigation instituted January 8, 1923, for the purpose of inquiring into the facts and circumstances surrounding the establishment of through rail-lake-and-rail rates and routes between eastern and western points in the United States which are in part via Canadian rail lines in connection with the Northern Navigation Company, a Canadian-owned steamship line operating between Sarnia, Ont., and Duluth, Minn. The investigation was for the purpose of considering the matter of the "recognition" of these rates and routes in the meaning of Section 27 of the merchant marine act of 1920, which prohibits the transportation of merchandise, on penalty of forfeiture thereof, in coastwise service between points in the United States, in vessels not owned by citizens of the United States and built and documented under the laws of the United States, but makes an exception of Canadian routes "heretofore or hereafter recognized by the Interstate Commerce Commission for which routes tariffs have been or shall hereafter be filed with said commission."

The Great Lakes Transit Corporation and the United States Shipping Board had asked the commission to suspend new tariffs covering such routes but the commission declined and ordered the investigation. As a result the commission finds that the law does not specify what constitutes "recognition" of the routes and rates and says the question is one to be determined by the courts.

The commission's report shows that it has received tariffs and approved rates applying via Canadian lake lines and that shippers in New England, Duluth and the Twin Cities earnestly insisted that the continuance of these through routes in connection with the Northern company is of great advantage and convenience to them, expressing the opinion that competition between the Northern company and the Great Lakes Transit Corporation will enable them to reap some of the benefits which they hoped would materialize from the separation of the boat lines and the rail lines in 1916. But, regarding the question of recognition the decision says:

Nowhere in the acts which we administer are we empowered to recognize one route and to deny recognition to another. The meaning and purport of recognition is nowhere stated. If the receipt and placing in our files of tariffs constitutes recognition, we have recognized these routes. If, as the Transit Corporation and the Shipping Board contend, something more is necessary to constitute recognition, we are nowhere advised what that something more is, or provided with a test or criterion by which to terminate under what circumstances and in what cases recognition may be accorded, denied or revoked.

Under section 27 of the Merchant Marine Act, 1920, recognition by us merely operates to stay the application of the section to merchandise transported in such manner as otherwise to be subject to the penalty of forfeiture thereof. That section apparently provides that merchandise transported over the routes here considered would, in the absence of recognition by us of these routes, be subject to forfeiture. Whether such merchandise is exempt from the penalty because we have recognized the routes is a question of fact to be determined by the court in which enforcement of that forfeiture may be sought. The duty of administering the Merchant Marine Act, 1920, does not rest upon us, and it is not within our province to construe its provisions.

Commissioners McManamy and Aitchison disagreed with the majority report of the commission for its failure to give a decision as to whether or not it has recognized the routes, saying that the

matter is left in uncertainty and will likely result in shippers foregoing the use of these routes because of the danger of forfeiture.

Personnel of Commissions

Samuel Hutchison, of Kansas City, Mo., has been appointed a member of the Missouri Public Service Commission, succeeding R. H. Musser, whose term has expired.

Frank P. Lannon, a member of the Public Utilities Commission of Colorado for four years, has been appointed chairman of the commission, succeeding Grant Halderman, whose term has expired. Daniel S. Jones has been appointed a member of the commission, succeeding Mr. Lannon.

Thomas F. Woodlock, who became a member of the Interstate Commerce Commission on April 1, under a recess appointment by President Coolidge, has been assigned by the commission to Division 4, which handles cases on the commission's finance docket, succeeding Commissioner Potter, resigned. The division now consists of Commissioners Meyer, Eastman and Woodlock. For a time after Mr. Potter's resignation Commissioner Aitchison served as a member of this division, but since April 2 the finance reports of the commission issued by Division 4 have carried Mr. Woodlock's name.

Court News

"Lookout" Statutes Not Applicable in Actions

Under Federal Employers' Liability Act

The Arkansas Supreme Court holds that local statutes imposing duties and liabilities on railroads, such as state "lookout" statutes, are not applicable in an action under the federal Employers' Liability Act.—*St. Louis S. W. v. Martin* (Ark.) 262 S. W. 982.

No Duty to Volunteer Assisting Brakeman

The Missouri Supreme Court holds that a person assisting the brakemen in making up a train without authority from the assistant superintendent, conductor or station agent, was either a volunteer, licensee or trespasser, to whom the railroad owed no duty except not to wilfully or wantonly injure him.—*Oatman v. St. L., S. W.* (Mo.) 263 S. W. 139.

Conversion of Trunk by Misdelivery

The Missouri Court of Appeals holds that delivery of a trunk to the wrong person is a conversion, even though the carrier afterwards recovers and delivers the trunk minus its contents; and in such a case the carrier cannot rely on the provision of the shipping contract limiting its liability to a stated value.—*Boone v. M. P.* (Mo. App.) 263 S. W. 495.

Duty to Prevent Overflow

The Missouri Court of Appeals holds that where, under the state statute, it is a railroad's duty to make an opening in its embankment so as to connect with a water course, the railroad cannot avoid its obligation by showing that further along the water course has been dammed by another railroad.—*Seward v. Aitchison, T. & S. F.* (Mo. App.) 262 S. W. 691.

Contributory Negligence of Guest in Automobile

The Texas Court of Civil Appeals held it reversible error in an action for the death of a passenger in an automobile to refuse to submit special issues as to contributory negligence of deceased in driving onto the crossing if he could with reasonable care have known of defects in the roadway proximately causing the injury.—*Gulf, C. & S. v. Woods* (Tex. Civ. App.) 262 S. W. 229.

Insufficient Averment of Place of Injury

The Alabama Supreme Court holds that an averment that the defendant was operating a railroad in St. Clair County, Ala., through and near Caldwell and negligently ran a train over plaintiff's dog, was held too indefinite as to the place of injury to enable the railroad to prepare its defense, and judgment for plaintiff was reversed.—*A. G. S. v. Sheffield* (Ala.) 100 So. 125.

Equipment and Supplies

Locomotives

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for 10, 8-wheel switching locomotives.

THE MINNEAPOLIS & ST. LOUIS is inquiring for 20 Mikado type locomotives. It was reported in the *Railway Age* of February 14 that this company had arranged for the purchase of a number of locomotives.

THE SEABOARD AIR LINE has ordered 10 Mountain type and 10 Mikado type locomotives from the Baldwin Locomotive Works. This is in addition to the 20 locomotives ordered from the American Locomotive Company as was reported in the *Railway Age* of April 11.

Freight Cars

THE STANDARD OIL COMPANY OF INDIANA is inquiring for 8 gondola cars.

THE ALLIS CHALMERS MANUFACTURING COMPANY is inquiring for 6 hopper cars.

THE FRUIT GROWERS EXPRESS is inquiring for 1,200 steel underframes for refrigerator cars.

SWIFT & COMPANY has ordered 100 underframes for refrigerator cars, from the Bettendorf Company.

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for 3,000 box cars, 1,000 automobile cars and 1,500 stock cars.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has placed an order with the Siems-Stembel Company for 10 milk car underframes.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA have ordered two tank cars of 4,300 gal. capacity from the Magor Car Corporation.

THE CARNEGIE STEEL COMPANY has ordered 50 gondola car bodies from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of February 28.

THE TIDAL OIL COMPANY has ordered 60 tank cars of 8,000 gal. capacity from the General American Tank Car Corporation. Inquiry for this equipment was reported in the *Railway Age* of March 14.

THE MISSOURI-KANSAS-TEXAS is inquiring for 300 hopper cars, 30 ft. 9 in. long, of 50 tons' capacity. The company has withdrawn its inquiry for 300 gondola cars, which was reported as part of an inquiry for 1,800 cars in the *Railway Age* of March 21.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered from the American Car & Foundry Company 100 gondola car bodies. Inquiry for this equipment was reported in the *Railway Age* of March 21. This company contemplates converting 500 coal cars to low-side gondola cars.

Passenger Cars

THE NEWFOUNDLAND GOVERNMENT RAILWAYS have given an order to the American Car & Foundry Company for two sleeping cars.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE will build 10 milk cars in its own shops at Shoreham, Minn. Inquiry for this equipment was reported in the *Railway Age* of February 14.

Iron and Steel

THE SOUTHERN RAILWAY is inquiring for 200 tons of steel for a bridge in North Carolina.

THE CAROLINA, CLINCHFIELD & OHIO is inquiring for 700 tons of steel for a shop at Erwin, Tenn.

THE ILLINOIS CENTRAL has ordered 620 tons of structural steel from the American Bridge Company.

THE UNION PACIFIC has ordered 512 tons of structural steel from the American Bridge Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 149 tons of structural steel from the Hansell-Elcock Company.

THE FLORIDA EAST COAST has ordered from the Virginia Bridge & Iron Company 600 tons of steel for three bridges.

THE ATLANTIC COAST LINE has ordered from the American Bridge Company about 300 tons of steel for four turntables.

THE MISSOURI-KANSAS-TEXAS has ordered 828 tons of structural steel for bridges from the Wisconsin Bridge & Iron Company.

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 500 tons of bridge steel, this in addition to 800 tons on which bids were recently received.

Machinery and Tools

THE ILLINOIS CENTRAL has ordered one bucket crane, one 15-ton electric traveling crane, and one 5-ton hand power crane from the Whiting Corporation.

Miscellaneous

THE READING COMPANY has given an order to the New York Shipbuilding Corporation for six car floats. Two of the floats are to be 250 ft. long and four of them 200 ft. long; all to have a beam of 34 ft. and a depth of 9 ft. Each float will have two tracks and a platform.

Signaling

THE BALTIMORE & OHIO has ordered from the Hall Switch & Signal Company, Garwood, N. J., 266 color-position-light signals, for installation at various points on the Baltimore & Ohio System; 204 high signals and 62 dwarf.

THE FIRST ANNUAL MEETING of the Mid-West Regional Advisory Board was held at the Hotel La Salle, Chicago, April 15, and was attended by 254 railroad representatives and 174 shippers' representatives. The proceedings consisted of the usual reports of committees and of railroad operating officers from 45 railroads who told of the condition of cars, important changes in freight train service and anticipated car requirements. The success of the Mid-West meetings was shown in the number of carriers that now have two-day service between Chicago and the Twin Cities, Minnesota. The next meeting will be held at Milwaukee, Wis., on July 15.

LOCOMOTIVE REPAIR SITUATION

Date, 1924	No. locomotives on line	No. serviceable	No. stored serviceable	No. req. classified repairs	Per cent	No. req. running repairs	Per cent	Total req. repairs	Per cent
February 1	64,377	53,586	4,116	5,919	9.2	4,872	7.6	10,791	16.8
April 1	64,363	52,805	4,648	6,128	9.5	5,430	8.4	11,558	17.9
July 1	64,416	53,382	7,117	6,035	9.4	4,999	7.7	11,034	17.1
October 1	64,538	53,209	5,424	6,175	9.6	5,154	8.0	11,329	17.6
January 1, 1925	64,384	53,118	4,849	5,927	9.2	5,339	8.3	11,266	17.5
February 1	64,308	52,994	4,220	6,143	9.6	5,171	8.0	11,314	17.6
March 1	64,255	52,851	4,988	6,217	9.7	5,187	8.0	11,404	17.7

Data from Car Service Division reports.

Supply Trade News

The Massey Concrete Products Company, Chicago, will construct a plant at Belleville, Ont.

The Symington Company has removed its New York office from the Woolworth building to 250 Park avenue.

The Gould Coupler Company and the Gould Storage Battery Company, Inc., on April 21, will remove their offices from 30 East Forty-second street to 250 Park avenue, New York City.

Fred C. Schreiber, representative of the Stocker-Rumely-Wachs Company, has resigned to become sales representative of Manning, Maxwell & Moore, Inc., with headquarters in Chicago.

Charles W. Beaver, sales manager of the Yale & Towne Manufacturing Company, has resigned, after nearly 25 years of service with that company, to spend a year in travel and recreation. Mr. Beaver was born at Cuba, Ill., October 9, 1875. He attended Wesleyan University, leaving to enter the service in the Spanish-American War, as lieutenant, United States Engineers. He entered the employ of the Yale & Towne Manufacturing Company in 1901. He has occupied the positions of manager of the hoist department, export manager, directing manager of subsidiary companies in Europe, general sales manager of the Yale & Towne Manufacturing Company, and vice-president and director of the Yale & Towne Company of London, England. His work has included on-the-ground experience in 23 different countries. Mr. Beaver is a past-president of the Railway Supply Manufacturers' Association, having officiated in that position for the two years from the 1922 meeting, including that of 1924. He is also a past-president of the American Supply & Machinery Dealers' Association.



C. W. Beaver

Schuyler Merritt, vice-president of the Yale & Towne Manufacturing Company, Stamford, Conn., has been elected chairman of the board of directors to succeed Henry R. Towne, deceased. Addison Boren, assistant to the president and controller, has been elected treasurer, succeeding J. H. Towne, who still retains the office of secretary. Gabriel S. Brown was elected a director.

The Minwax Company, Inc., has removed its office from 18 East Forty-first street to 270 Madison avenue, New York City, and its Chicago district office has been removed to 10 East Huron street, Chicago.

The Harnischfeger Corporation, Milwaukee, Wis., will remove its Pittsburgh, Pa., sales office on May 1 from the Fidelity building to 612 Farmers Bank Building, Fifth avenue and Wood street. A. J. Dreyer is district manager and M. B. Bradley is sales engineer at this office.

The Railway Car Forging Company, Chicago, has been incorporated to manufacture iron and steel forgings, pressed steel parts and other metal products for car equipment. The company has taken over the Chicago Heights, Ill., plant of the Illinois Car & Manufacturing Company.

The G. A. Gray Company is constructing a new shop and office building at Evanston (Cincinnati), Ohio. The shop is to be a steel frame building, 420 ft. by 210 ft., with walls of steel sash and glass. The office building will be a two-story brick structure, located at the eastern end of the shop.

Gardiner & Lewis, Inc., New York, on March 23 changed its name to the Lewis Asphalt Engineering Corporation. The main office of the corporation continues at the old address, 30 Church street, New York City. The change of name carries with it no change in ownership, management or policy, nor in the administrative and technical personnel.

L. W. Grothaus, district manager of the Allis-Chalmers Manufacturing Company, with headquarters at Cleveland, Ohio, has been promoted to assistant manager of the electrical department, with headquarters at Norwood, Ohio; and will be succeeded by A. H. Wyman, district manager, with headquarters at Salt Lake City, who in turn will be succeeded by H. E. Weiss, sales engineer, with headquarters in Chicago.

Harry B. Gilmore, for the past 17 years manager of the distributing organization of the Western Electric Company, at Boston, Mass., has been elected secretary of the company. A few months ago he was made assistant secretary and was transferred to New York. He succeeds as secretary George C. Pratt who in the future will devote his entire time to his duties as general attorney. Donald S. Pratt was elected an assistant secretary.

Charles D. Little, general manager of sales, has been elected vice-president in charge of sales and a member of the board of the Crane Company, Chicago; he succeeds the late E. H. Raymond. H. W. Seymour, the branch manager at Baltimore, Md., has been elected general manager of sales to succeed Mr. Little, and Walter Evensen was elected treasurer, P. T. Kelly continuing as vice-president in charge of finance.

Obituary

Charles A. Coons, formerly secretary of the Paxton-Mitchell Metallic Packing Company, Omaha, Nebr., died on March 31.

Ralph C. Davison, engineer of the American Abrasive Metals Company, New York, died of pneumonia on April 15 at his home in Plainfield, N. J., at the age of 50. Mr. Davison was educated at Stevens Institute. He became associated with the American Abrasive Metals Company in January, 1918, and previously had served for about ten years with the American Mason Safety Tread Company, New York, in a selling and engineering capacity and as a director. He had also been connected with the Concrete Association of America, and at one time was an associate editor of the Railroad Gazette. Mr. Davison was a member of the American Society of Mechanical Engineers, the American Society of Safety Engineers and the New York Railroad Club.

Trade Publications

THE NATIONAL ASSOCIATION of Gummed Tape Manufacturers has issued a 16-page booklet entitled "Efficiency in the Shipping Room," which describes the proper methods of sealing containers. The booklet describes the proper use and application of tape and is illustrated by photographs.

IMPROVED HOISTING EQUIPMENT.—Roberts & Schaefer Company, Chicago, has issued a four-page folder illustrating and describing a new hoist which this company is installing in coaling stations. It consists of a cable drum direct-connected to an electric motor with an ingenious form of reduction gear inclosed inside the drum. The design provides for automatic operation with adequate safety appliances.

THE USES OF MANGANESE STEEL.—In a four-page folder the American Manganese Steel Company, Chicago Heights, Ill., has listed under classified headings practically all of the uses to which this material has been applied successfully. The listing is alphabetical and affords a classification both as to classes of equipment and users. One page is devoted to a catechism on the nature and characteristics of manganese steel.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—The Interstate Commerce Commission has issued a certificate permitting the Elkhart & Santa Fe to construct a 56-mile line from Elkhart on the Kansas-Oklahoma state line southwesterly into Texas county and Cimarron county, Okla., control of the company to be acquired by the Atchison, Topeka & Santa Fe by the purchase of capital stock and by lease.

ATCHISON, TOPEKA & SANTA FE.—The cost of the construction of a viaduct over the Los Angeles river and the railway tracks at Macy street, Los Angeles, Calif., which is to be constructed jointly by the Santa Fe, the Union Pacific, the Los Angeles street railway, the Los Angeles County and the city of Los Angeles, Cal., has been apportioned by the Railroad Commission of California, and the construction is to be undertaken soon. The viaduct will be of steel and concrete with a 215-ft. single arch span across the river. The Union Pacific tracks on the east side and the Santa Fe tracks on the west side are to be depressed under the bridge. The total cost is estimated at \$600,000.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has applied to the Interstate Commerce Commission for authority to construct a line from O'Keene to Homestead, Okla., 3.73 miles.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has awarded a contract to the Folwell-Ahlskog Company, Chicago, for the construction of a grain elevator at Council Bluffs, Iowa, to cost \$200,000, as reported in the *Railway Age* of February 28.

DENVER & RIO GRANDE WESTERN.—This company has applied to the Interstate Commerce Commission for authority for the construction of a branch line from Soldier Summit to Vernal, Utah, 131.6 miles, through the Uintah basin.

FORT WORTH & DENVER SOUTH PLAINS.—This company has applied to the Interstate Commerce Commission for authority to construct an east and west line from Carey through Plainview to the center of Castro county, Tex., 130 miles and a north and south line, crossing it at a point 22 miles east of Plainview, from Silverton to Lubbock, Tex., 53 miles. The line is to be constructed and operated as a part of the Colorado & Southern System in connection with the Fort Worth & Denver City.

GREAT NORTHERN.—Bids will soon be asked for the construction of an engine terminal at Troy, Mont., to cost \$150,000, authorization for which was reported in the *Railway Age* of February 14. The terminal will include an enginehouse, machine shop and power house.

ILLINOIS CENTRAL.—A contract for the construction of a 1,200-ton reinforced concrete coaling station at Markham yard, Chicago, has been awarded to A. M. Crain, Chicago.

LOS ANGELES & SALT LAKE.—The Railroad Commission of California has ordered this company to prepare plans for the elimination, jointly with the Atchison, Topeka & Santa Fe and the Los Angeles railway company, of the grade crossing of Santa Fe avenue and the tracks of the Los Angeles railway with the tracks of the Los Angeles & Salt Lake and the Santa Fe at the intersection of Butte street and Santa Fe avenue in Los Angeles, Calif. The separation of the grades is to be effected by the construction of a subway carrying Santa Fe avenue and the tracks of the Los Angeles railway under the tracks of the Los Angeles & Salt Lake and the Santa Fe. The cost of the project is estimated at \$233,000.

LOUISVILLE & NASHVILLE.—A contract has been awarded to the E. G. Parish Construction Company, Jackson, Tenn., for the construction of a one-story brick passenger station at Humboldt, Tenn., to be used jointly with the Mobile & Ohio.

MERIDIAN & BIGBEE VALLEY.—This company has applied to the Interstate Commerce Commission for authority to complete the construction of its line from Meridian, Miss., to Myrtlewood, Ala.

NEW YORK CENTRAL.—The George W. Rogers Contracting Corporation, New York, has the contract for eliminating this com-

pany's highway grade crossing at Massey street, Watertown, N. Y.; approximate cost, \$60,000. A contract has been awarded to Wm. M. Ballard, Inc., Syracuse, N. Y., for the elimination of an aqueduct at Washington street, that city; estimated cost, \$25,000.

NEW YORK, NEW HAVEN & HARTFORD.—Henry R. Kent & Company, Rutherford, N. J., has secured a contract for the provision of shop facilities for the repair of marine equipment at this company's terminal at Harlem River, New York City; estimated cost, \$85,000.

OWENSBORO, ROCKFORD & CHICAGO.—The contract for the construction of the proposed 84-mile line from Owensboro, Ky., to Elinora, Ind., at a cost of \$7,000,000, has been awarded to Paul Meredith, Indianapolis, Ind. The construction will not begin until the project is approved by the Interstate Commerce Commission. As reported in the *Railway Age* of November 22, examiners of the commission last November recommended findings by commission that public convenience and necessity do not require the construction of the line.

PECOS & NORTHERN TEXAS.—This company has applied to the Interstate Commerce Commission for authority to construct an extension from Lider to Silverton, Tex., 30 miles.

PENNSYLVANIA.—A contract has been awarded to the McClintic-Marshall Company for overhead street crossings at Twenty-third and Twenty-fourth streets, Pittsburgh, Pa.; 350 tons of structural steel will be required.

READING COMPANY.—This company has awarded a contract to John H. Wickersham, Lancaster, Pa., to furnish all labor, material, etc., necessary for grading and masonry required in connection with the reconstruction of Bridge No. 7/30 south of Boyertown on its Colesbrookdale Branch.

SOUTHERN PACIFIC.—Press reports state that plans are being prepared for the enlargement of the yard at Marysville, Cal., at a cost of \$125,000.

SOUTHERN.—To repair the damage done by the tornado to its shops at Princeton, Ind., this company has awarded a contract to Dwight P. Robinson & Company for the following replacement work and additional facilities:

- Construction of a new 25-stall roundhouse, 100 ft. deep.
- Replacing smith shop in original shape, exact size.
- Making necessary repairs to replace machine and erecting shop in original condition using steel sash instead of wooden sash.
- Replacing new in original condition boiler-house stack 125 ft. high.
- Repairing tin shop building.
- Replacing destroyed portion of boiler shop, providing steel frame with 15-ton crane runway.
- Rebuilding car repair shed in original shape with exception of changes in roof construction.
- Enlarging coach shop by adding 10 ft. on one side and 30 ft. on another.
- Repairing planing mill building.
- Replacing two-story storeroom and office building and building an addition of 12 ft. on west end.
- Rebuilding dry lumber shed in original shape.
- Rebuilding paint room in original shape.
- Making necessary repairs to power wiring, power distribution, and yard lines.
- Extending steam lines from boiler plant to smith shop.

In addition to the above, the following work will be done:

- Building new 300-ton steel coal chute, sand handling plant and standpipe—contract for which has been let to Fairbanks, Morse & Company.
- Repairs to two foremen's offices and enginemen's wash and locker room—to be done by company forces.

THE ILLINOIS CENTRAL is publishing an advertisement signed by C. H. Markham, president, in various newspapers along its lines, showing that the freight charges on the average dollar dinner are only one cent. In computing the charges on the various food-stuffs, the rates to Springfield, Ill., from the widely scattered parts of the country from which the commodities are shipped are used. In July, 1921, a similar computation was made which showed that the freight charges on the entire meal amounted to only about 1 cent and 3 mills, a reduction in freight charges on a meal of about 2½ mills, or 16½ per cent. "This is roughly indicative of the reduction made in all freight rates in the last four years," says the advertisement. "Since 1921 the public has paid about one billion six hundred million dollars less for railway transportation than it would have paid if there had been no reduction in rates during that period. The benefit of these rate reductions in 1924 alone amounted to about \$6,000,000, or nearly \$6 for every member of our population."

Railway Financial News

AKRON, CANTON & YOUNGSTOWN.—Bonds Authorized.—The Interstate Commerce Commission has authorized an issue of \$750,000 6 per cent general and refunding mortgage bonds, Series A, to be sold at not less than 90. The bonds are to be sold to F. R. Sawyer & Co., of Boston, as noted in the *Railway Age* of February 28. The company also asked authority to execute a mortgage for \$4,000,000, which part of the application is not covered in this decision.

ALABAMA & VICKSBURG.—Authorized to Issue Stock.—The Interstate Commerce Commission has granted authority for a 100 per cent stock dividend amounting to \$2,100,000. The Alabama & Vicksburg, as of December 31, 1924, had capital stock outstanding of \$2,100,000, funded debt totaling \$2,500,000, making a total capitalization of \$4,600,000; as of that date its investment in road and equipment, less depreciation, totaled \$7,640,254. There was a corporate surplus of \$4,229,915. Commissioner Eastman dissented.

Stockholders of the Alabama & Vicksburg have recently approved the acquisition of their property by the Illinois Central.

ANDALUSIA, FLORIDA & GULF.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Galliver, Fla., to Falco, Ala., 25.5 miles.

ATCHISON, TOPEKA & SANTA FE.—Annual Report.—See article on another page entitled "Santa Fe Has Record-Breaking Year."

ATCHISON, TOPEKA & SANTA FE.—Bonds of Subsidiary Company.—The Interstate Commerce Commission has granted authority to the North Texas & Santa Fe to issue a first mortgage, 6 per cent bond, series A, amounting to \$2,200,000 to be delivered to the Atchison, Topeka & Santa Fe in satisfaction of a like amount of indebtedness for advances. All of the stock of the North Texas & Santa Fe is owned by the parent company and its line from Spearman, Tex., to Shattuck, Okla., 85 miles, is leased to the Panhandle & Santa Fe.

BALTIMORE & OHIO.—Bonds.—The Interstate Commerce Commission has authorized this company to extend from July 1, 1925, to July 1, 1950, the maturity date of \$45,000,000 of southwestern division first mortgage 3½ per cent bonds, with the obligation to pay additional interest of 1½ per cent.

BOSTON & MAINE.—Abandonment of Nashua & Acton.—The Interstate Commerce Commission has granted authority to the Boston & Maine to abandon operation of the Nashua & Acton line between Nashua, N. H., and North Acton, Mass., 20 miles. The Boston & Maine is also allowed to abandon operation under trackage rights over the Old Colony, a subsidiary of the New York, New Haven & Hartford, between Acton Junction, Mass., and Concord Junction, 4.3 miles, practically an extension of the Nashua & Acton. The carrier's application was approved by the state commissions of both Massachusetts and New Hampshire. The Boston & Maine controls the Nashua & Acton by ownership of its entire capital stock. The latter was built in 1873. Operation of the line has been generally unprofitable and the commission says that "Apparently the results have not justified its construction." The territory is served by other railroads and highways and no point in it is more than four miles in a straight line from another rail line.

CANADIAN NATIONAL RAILWAYS.—Annual Report.—The annual report of the Canadian National Railways covering the year 1924, tabled in the House of Commons on Wednesday, shows that in spite of a decrease in gross earnings of \$17,547,305, due to a smaller crop and general business conditions throughout the country, the company was successful in earning a net operating profit of \$17,244,251, or only \$3,186,398 less than in the preceding year, and, therefore, maintained to a very considerable degree the rate of improvement obtained during 1923.

The total operating revenues, operating expenses and net operating profits of the company for 1924 and 1923 were as follows:

	1924	1923	Decrease
Total operating revenues.....	\$235,588,183	\$253,135,488	\$17,547,305
Total operating expenses.....	218,343,931	232,704,839	14,360,907
Net operating profits.....	17,244,251	20,430,649	3,186,398

While a comparison of the net operating profits for 1923 and 1924 shows a decrease during the past year of \$3,186,398, a comparison of the net before fixed charges over the same period shows an increase of \$1,270,679. Fixed charges, however, increased \$4,433,423, resulting in an increase in the net income deficit of \$3,162,744. The position is summarized as follows:

	1924	1923	Increase
Net before fixed charges.....	\$14,772,328	\$13,501,649	\$1,270,679
Fixed charges.....	69,632,747	65,199,324	4,433,423
Net income deficit.....	54,860,419	51,697,675	3,162,744

CENTRAL OF NEW JERSEY.—Equipment Bonds.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$1,500,000 of 4½ per cent equipment bonds.

CHICAGO, BURLINGTON & QUINCY.—May Purchase Line.—A rumor is reported from Quanah, Tex., to the effect that negotiations for the purchase of the Quanah, Acme & Pacific by the Burlington are practically completed. The Quanah, Acme & Pacific connects with the Ft. Worth & Denver City, a subsidiary of the Burlington, at Quanah and runs southwest to MacBain, Tex., 90 miles. It is said that the line will be extended 60 miles from MacBain to Lubbock.

CHICAGO GREAT WESTERN.—1924 Earnings.—Annual report shows net after charges for 1924 of \$601,558, equivalent to \$1.28 per share on the company's preferred stock. Net after charges in 1923 totaled \$570,767, equivalent to \$1.24 per share on the preferred stock. Selected items from the income statement follow:

	1924	1923	Increase or decrease
Average mileage operated.....	.....	.....	.....
Railway operating revenues.....	\$24,726,678	\$25,723,707	—\$997,028
Maintenance of way.....	\$3,682,233	\$3,791,296	—\$109,063
Maintenance of equipment.....	4,726,280	5,238,113	—\$511,833
Transportation.....	10,228,278	10,806,237	—\$577,960
Total operating expenses.....	\$20,238,411	\$21,431,016	—\$1,192,605
Operating ratio.....	81.84	83.31	—1.47
Net revenue from operations.....	\$4,488,268	\$4,292,691	\$195,577
Railway tax accruals.....	945,933	856,144	89,789
Railway operating income.....	\$3,538,480	\$3,433,216	\$105,264
Equipment rents, net dr.....	\$462,731	\$493,488	—\$30,757
Joint facility rents, net dr.....	841,703	821,055	20,648
Net railway operating income.....	\$2,234,046	\$2,118,672	\$115,374
Non-operating income.....	176,641	266,888	—92,247
Gross income.....	\$2,408,687	\$2,385,561	\$23,126
Interest on funded debt.....	\$1,714,325	\$1,674,019	\$40,305
Total deductions from gross income..	\$1,807,129	\$1,814,794	—\$7,665
Net income.....	\$601,558	\$570,767	\$30,791

CHICAGO, ROCK ISLAND & PACIFIC.—Abandonment.—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Homestead to Watonga, Okla., 21.93 miles, now operated by it as lessee of the Choctaw, Oklahoma & Gulf.

CHICAGO, ROCK ISLAND & PACIFIC.—Abandonment of Line Permitted.—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon a portion of its so-called Blue Grass Line between West Davenport, Ia., and Stockton, 16 miles. Hearings in this case were held by the Iowa Board of Railroad Commissioners, which recommended that the application be granted. The territory involved is served by other lines of the Rock Island. In the case of the single station affected, Blue Grass, the Rock Island proposes to convey its station facilities to an interurban railway, which will continue them in use.

DENVER & RIO GRANDE.—Suit.—Justice Francis Delehanty of the New York State Supreme Court has issued an order to show cause why Kingdon Gould and Schuyler Nielson Rice, as executors of the estate of George J. Gould, should not be made parties defendant in the \$200,000,000 suit brought by stockholders against the former directors of the Denver & Rio Grande. A similar motion was denied some time ago by the Court of Appeals, which held that, inasmuch as George J. Gould was a citizen of New Jersey, the executors could not be named in the suit. The motion is based on the decision of the Court of Appeals, handed down last February, and followed by the enactment of a law believed to authorize the continuance of an action against executors of an estate under cir-

(Continued on page 1014)

Annual Report

The Atchison, Topeka & Santa Fe Railway Co. —Thirtieth Annual Report

MARCH 4, 1925.

To the Stockholders:

Your Directors submit the following report for the fiscal year January 1, 1924, to December 31, 1924, inclusive.

The lines comprising the Atchison System, the operations of which are embraced in this report, and the mileage in operation at the end of the year as compared with the previous year, are as follows:

	Dec., 31, 1924	Dec., 31, 1923
Atchison, Topeka & Santa Fe Railway....	9,142.88 miles	8,931.17 miles
Gulf, Colorado & Santa Fe Railway.....	1,908.84 "	1,908.89 "
Panhandle & Santa Fe Railway.....	853.18 "	853.18 "
*Grand Canyon Railway.....		64.09 "
	11,904.90 "	11,757.33 "

Increase during the year 147.57 miles.

The average mileage operated during the fiscal year ending December 31, 1924, was 11,830.81, being an increase of 48.66 miles over the average mileage operated during the preceding fiscal year.

The Company is also interested jointly, through ownership of stocks and bonds, in other lines aggregating 567.85 miles, namely Northwestern Pacific Railroad 517.79 miles and Sunset Railway 50.06 miles.

For detailed statement of present mileage and for changes in mileage during the year see pages 40 to 46 (of pamphlet report).

* Operated by Atchison, Topeka & Santa Fe Railway under lease effective January 1, 1924.

Income and Profit and Loss Statement

The following is a summary of the transactions of the System for the years ending December 31, 1923 and 1924:

	1923	1924
Operating Revenues	\$238,683,735.50	\$235,410,951.54
Operating Expenses	173,076,268.03	170,314,807.65
Net Operating Revenue.....	\$65,607,467.47	\$65,096,143.89
Railway Tax Accruals.....	20,316,490.82	17,730,961.09
Uncollectible Railway Revenues.....	112,187.29	66,084.85
Equipment and Joint Facility Rents.....	1,183,482.43	15,819.03
Net Railway Operating Income.....	\$46,362,271.79	\$47,283,278.92
Other Income	7,504,269.25	6,653,870.47
Gross Income	\$53,866,541.04	\$53,937,149.39
Miscellaneous Tax Accruals.....	54,479.76	53,895.92
Rent for Leased Roads and Other Charges..	400,516.82	483,451.46
	\$53,411,544.46	\$53,399,802.01
Interest on Bonds, including accrued interest on Adjustment Bonds.....	11,323,743.12	11,247,995.50
Net Corporate Income (representing amount available for dividends and surplus).....	\$42,087,801.34	\$42,151,806.51
From the net corporate income for the year the following sums have been deducted:		
DIVIDENDS ON PREFERRED STOCK—		
No. 52 (2½%) paid Aug.		
1, 1924	\$3,104,320.00	
No. 53 (2½%) paid Feb.		
2, 1925	3,104,320.00	
	\$6,208,640.00	
DIVIDENDS ON COMMON STOCK—		
No. 76 (1½%) paid June		
2, 1924	\$3,486,142.50	
No. 77 (1½%) paid Sept.		
2, 1924	3,486,142.50	
No. 78 (1½%) paid Dec.		
1, 1924	3,486,142.50	
No. 79 (1½%) paid Mar.		
2, 1925	4,067,166.25	
	14,525,593.75	
California-Arizona Lines Bonds Sinking Fund	18,437.12	
S. F. & S. J. V. Ry. Co. Bonds Sinking Fund	26,776.18	
	20,779,447.05	
Surplus carried to Profit and Loss.....	\$21,372,359.46	
Surplus to credit of Profit and Loss, December 31, 1923.....	\$165,149,178.69	
Transfer from appropriated surplus representing reversal of appropriations prior to July 1, 1907, for additions and betterments, Mojave Division, heretofore carried in "Additions to property through Income and Surplus".....	583,041.82	
Sundry Adjustments	482,152.16	
	\$166,214,372.67	
Surplus appropriated for investment in physical property	167,400.09	
	166,046,972.58	
Surplus to credit of Profit and Loss December 31, 1924.....	\$187,419,332.04	

"Other Income" consists of interest accrued and dividends received on securities owned, including United States Government securities, interest on bank balances, rents from lease of road and other property, and other miscellaneous receipts.

Capital Expenditures and Reduction of Book Values

The total charges to Capital Account, as shown by the General Balance Sheet, page 24, at December 31, 1924, aggregated \$963,423,557.45 compared with \$937,015,525.59 at December 31, 1923, an increase during the year of \$26,408,031.86, which analyzes as follows:

Construction and acquisition of new mileage, including the acquisition of bonds and stocks of other railway companies:		
Atchison, Topeka & Santa Fe Ry.....	\$474,164.80	
California Southern R. R.....	2,076.73	
Eldorado & Santa Fe Ry.....	367,497.28	
Oklahoma Central R. R.....	3,237.55	
Osage County & Santa Fe Ry.....	14,845.20	
Rocky Mountain & Santa Fe Ry.....	267,213.45	
Salina & Santa Fe Ry.....	888,844.06	
Santa Fe & Los Angeles Harbor Ry....	493,547.08	
Tulsa & Santa Fe Ry.....	568.05	
	\$2,507,840.74	
Additions and Betterments:		
Fixed Property	\$21,276,971.55	
Equipment—		
Railroad Companies	2,578,694.68	
Santa Fe Land Improvement Co....	23,598,413.81	
Betterments to Equipment—		
Railroad Companies	538,086.65	
Santa Fe Land Improvement Co....	607,940.99	
	\$43,442,718.32	
Investments in Terminal and Collateral Companies:		
Beaumont Wharf & Terminal Co.....	\$1,064.08	
Denver Union Terminal Ry. Co.....	7,444.89	
Houston Belt & Terminal Ry. Co.....	47,925.41	
Kansas City Terminal Ry. Co.....	265,975.44	
Northwestern Pacific R. R. Co.....	4,750.00	
Pueblo Union Depot & R. R. Co.....	4,709.22	
Santa Fe Land Improvement Co.....	614,229.32	
Sunset Ry. Co.	4,000.00	
Toluca Mining Co.	45,000.00	
Union Passenger Depot Co. of Galveston.	2,597.41	
	870,213.75	
Miscellaneous Physical Property.....	464,576.46	
Other Investments, including Sinking Fund.....	3,462,062.68	
Miscellaneous items	9,733.84	
	\$48,997,250.61	
Less: Net decrease in investment in obligations of the U. S.	22,589,218.75	
Net increase in Capital Account during the year.....	\$26,408,031.86	

Credits in italics.

The net charge of \$21,019,719.13 for "Equipment" analyzes as follows:

60 Locomotives	\$4,284,046.17
1 Locomotive Tender	10,510.15
5,514 Freight-Train Cars	15,495,905.97
108 Passenger-Train Cars	1,891,432.99
576 Miscellaneous Work Cars.....	1,937,205.78
Floating Equipment (Additional Charges).....	514.20
11 Miscellaneous Equipment	10,871.49
	\$23,630,486.75
Less—Ledger Value of Equipment retired during the year as follows:	
55 Locomotives	\$712,068.54
1,378 Freight-Train Cars	1,213,213.99
93 Passenger-Train Cars	520,558.71
203 Miscellaneous Work Cars.....	110,280.46
1 River Steamer	50,215.59
8 Miscellaneous Equipment	4,430.33
	2,610,767.62
	\$21,019,719.13

The additions and retirements reported above include the following conversions:

- 263 Freight-train cars converted to miscellaneous work cars.
- 5 Passenger-train cars converted to freight-train cars.
- 58 Passenger-train cars converted to miscellaneous work cars.
- 6 Miscellaneous work cars converted to freight-train cars.
- 1 Car converted from one class of miscellaneous work cars to another.

Maintenance of Equipment

For the year ending December 31, 1924, maintenance charges, including renewals and depreciation, averaged as follows:

Per locomotive	\$10,605.24
Per locomotive mile.....	.3768
Per freight car	300.98
Per freight car mile.....	.0232
Per passenger car, including mail and express.....	2,173.84
Per passenger car mile.....	.0191

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The foregoing average maintenance charges include a proportion of unlocated expenditures for Maintenance of Equipment charged to Superintendence, Shop Machinery, Injuries to Persons, Insurance, Stationery and Printing, Other Expenses, and Maintaining Joint Equipment at Terminals.

Comparison of Operating Results

The following is a statement of revenues and expenses of the System for the year ending December 31, 1924, in comparison with the previous year:

	Year ending Dec. 31, 1924	Year ending Dec. 31, 1923	Increase or Decrease
OPERATING REVENUES:			
Freight	\$168,101,035.56	\$166,332,196.07	\$1,768,839.49
Passenger	48,154,635.79	52,918,569.71	-4,763,933.92
Mail, Express, and Miscellaneous	19,155,280.19	19,432,969.72	-277,689.53
Total Operating Revenues	\$235,410,951.54	\$238,683,735.50	-\$3,272,783.96
OPERATING EXPENSES:			
Maintenance of Way and Structures	\$36,713,084.00	\$33,621,545.80	\$3,091,538.20
Maintenance of Equipment	52,780,855.60	57,605,366.95	-4,824,511.35
Traffic	4,460,559.96	4,216,341.52	244,218.44
Transportation—Rail Line	72,599,042.71	73,590,673.87	-991,631.16
Miscellaneous Operations	136,350.56	77,472.43	58,878.13
General	5,212,236.39	5,036,334.77	175,901.62
Transportation for Investment—Cr.	1,587,321.57	1,071,467.31	515,854.26
Total Operating Expenses	\$170,314,807.65	\$173,076,268.03	-\$2,761,460.38
Net Operating Revenue	\$65,096,143.89	\$65,607,467.47	-\$511,323.58
Railway Tax Accruals.....	17,730,961.09	20,316,490.82	-2,585,529.73
Uncollectible Ry. Revenues..	66,084.85	112,187.29	-46,102.44
Railway Operating Income	\$47,299,097.95	\$45,178,789.36	\$2,120,308.59
Equipment Rents—Net—Cr.	551,912.27	1,760,908.65	-1,208,996.38
Joint Facility Rents—Net—Dr.	567,731.30	577,426.22	-9,694.92
Net Railway Operating Income	\$47,283,278.92	\$46,362,271.79	\$921,007.13

The following averages for 1924 compared with 1923 are deduced from tables set forth on pages 33 and 37.

The average tons of freight (revenue and company) per loaded car mile increased from 21.31 to 21.87 or 2.63 per cent.

The average tons of freight (revenue and company) carried per freight-train mile (freight and mixed) increased from 587.63 to 646.70 or 10.05 per cent.

The average freight revenue per freight-train mile increased from \$6.86 to \$7.29, or 6.27 per cent.

The average passenger revenue per passenger-train mile decreased from \$2.25 to \$2.06, or 8.44 per cent.

The average passenger-train revenue per passenger-train mile decreased from \$2.90 to \$2.69, or 7.24 per cent.

The tons of freight carried one mile (revenue and company, but excluding water ton miles) increased 654,270,809, or 4.59 per cent, while miles run by freight cars (loaded and empty) in freight and mixed trains increased 25,958,951, or 2.54 per cent, and the mileage of such trains decreased 1,203,735, or 4.96 per cent.

The number of passengers carried one mile decreased 104,052,843, or 6.45 per cent, while miles run by passenger-train cars (excluding work) in passenger and mixed trains increased 109,797, or .06 per cent, and the mileage of such trains decreased 55,007, or .23 per cent.

Capital Stock and Funded Debt

The outstanding Capital Stock on December 31, 1923, consisted of:

Common	\$232,418,500.00
Preferred	124,173,700.00
	\$356,592,200.00

Capital Stock returned by depository under the Reorganization Plan of March 14, 1895, undelivered because unclaimed or forfeited for failure to comply with terms of the organization plan:

Common	\$9,000.00
Preferred	900.00
	9,900.00

Capital Stock outstanding December 31, 1924:

Common	\$232,409,500.00
Preferred	124,172,800.00
	\$356,582,300.00

The number of holders of the Company's capital stock at the close of the last five years and the changes in number from year to year were as follows:

	Common		Preferred	
	Number	Increase for year	Number	Increase for year
1920.....	36,469	5,188	21,367	1,724
1921.....	39,614	3,145	22,065	698
1922.....	41,845	2,231	22,798	733
1923.....	43,508	1,663	23,610	812
1924.....	41,808	1,700	23,691	81

Decrease in italics.

The outstanding Funded Debt of the System amounted, on December 31, 1923, to..... \$275,958,983.70

The following changes in the Funded Debt occurred during the year:

Obligations Retired:	
S. F. & S. J. V. Ry. Co. First Mortgage 5% Bonds	\$27,000.00
Obligations Issued:	
California-Arizona Lines First and Refunding Mortgage 4½% Bonds.....	1,174.80
Decrease of Funded Debt	25,825.20
Total System Funded Debt outstanding December 31, 1924	\$275,933,158.50

Treasury

Neither this Company nor any of its auxiliaries has any notes or bills outstanding.

The Company held in its treasury on December 31, 1924, \$35,623,425.71 cash. In addition, the Company owns \$12,362,400.00 of United States Government securities, which are carried at cost of \$12,425,376.81 in the general balance sheet.

Construction of New Lines

The present status of new lines under construction is as follows:

SALINA AND SANTA FE RAILWAY

On July 1, 1924, your Company advanced to The Salina and Santa Fe Railway Company the funds with which to purchase the railroads of The Salina Northern Railroad Company. This line extends from a connection with your present line at Salina, Kansas, in a general northwesterly direction to Osborne, Kansas, a distance of approximately 81 miles. On the same day the property was leased to your Company and placed in service. This property traverses an agricultural section of north central Kansas and is expected to prove a valuable feeder.

SANTA FE, RATON AND EASTERN RAILROAD

As of January 1, 1924, the Rocky Mountain & Santa Fe Railway Company, one of your subsidiary companies, acquired the property of the Santa Fe, Raton and Eastern Railroad Company, consisting of a railroad extending from a point on your line near Raton, New Mexico, in a general northeasterly direction a distance of 9.7 miles to the Yankee and Sugarite coal mining districts of New Mexico. As of the same date the property was leased to your Company and placed in service.

MARLAND SPUR

During the year your Company constructed a branch line known as the Marland Spur beginning at a point on the main line near Marland, Oklahoma, and extending in a westerly direction a distance of 9.86 miles to serve the Three Sands oil producing areas in the Mid-Continent Field. This line was placed in service on January 1, 1925.

MAGUNDEN-ARVIN LINE

During the year negotiations were completed for the purchase from the Southern Pacific Railroad Company of an undivided one-half interest in the line from Magunden, near Bakersfield, to Arvin, California, a distance of 16.75 miles, and two spurs of 1.60 miles and 1.41 miles respectively. The line will be operated in alternate years by the interested companies. Operation by your Company commenced January 1, 1925.

Additional Main Track Mileage

The mileage of second track in operation at December 31, 1924, was 1,596.15 miles. All the second track referred to as authorized in the last annual report has been completed and placed in operation.

Guaranty Under Transportation Act, 1920

Final settlement of the claim under the provisions of Section 209 of the Transportation Act, 1920, has not yet been accomplished. The Bureau of Accounts of the Interstate Commerce Commission has completed its audit of our accounts and the conclusion of the matter is now in the hands of the Bureau of Finance.

Taxes

Federal, State and Local tax accruals for the year 1924 aggregate \$17,730,961.09, a decrease under the year 1923 of \$2,585,529.73. A comparison of these accruals for the two years is presented in the following table:

	1924	1923	Increase or decrease
Federal Taxes:			
Income and War...	\$5,365,110.84	\$9,112,560.99	-\$3,747,450.15
Capital Stock.....	445,800.49	403,595.50	42,204.99
Stamp and License..	1,552.76	4,824.13	-3,271.37
Total Federal	\$5,812,464.09	\$9,520,980.62	-\$3,708,516.53
State and Local.....	11,918,497.00	10,795,510.20	1,122,986.80
Grand total	\$17,730,961.09	\$20,316,490.82	-\$2,585,529.73

[ADVERTISEMENT]

General

During the first six months of 1924 traffic was decidedly light and net earnings of the Company were small, being less than interest and dividends. Notwithstanding this, it was deemed wise to carry out the program of additions and betterments and of maintenance which had been adopted at the beginning of the year, because the work was well organized, conditions were favorable, and the very lightness of traffic meant a minimum of interference between its movement and the prosecution of such work. As a result the railroad was in condition to handle the heavy traffic of the fall months economically and at the same time most satisfactorily to its patrons, and net revenue from railway operations of the last six months would have more than offset earlier losses if passenger traffic had not been substantially lighter than the preceding year. In common with other railroads, it is found that automobiles and bus lines are taking quite a large amount of the Company's passenger traffic.

Considerable territory adjacent to your Company's lines in the western part of Texas has been held heretofore in large bodies for cattle ranch purposes. This has done much to prevent settlement and development, but a marked change has taken place lately and these large ranches are now being rapidly broken up and sold, mostly in 160-acre tracts. Many small towns are building up, and railroad earnings from this territory are showing increases. This development is especially marked along the main line from Texico to Lubbock and along the main line and branches from Canyon City south to Slaton, including the Lamesa Branch. This region had excellent grain and cotton crops in 1924 and thus far has been free from the boll weevil, with a reasonable prospect that it will continue so because of the high altitudes, sharp cold spells in winter, and dry climate. Cotton does well here and is the chief single factor in all this activity. Lying directly west of Lubbock is a territory comprising about one million acres, nearly all good agricultural land. To open this for settlement it is proposed to build during 1925 a line 65 miles long to a point near the western border of the State and with the great number of settlers now going into this region this line should prove a good feeder to the Atchison System.

It has been the policy of the Company each year to put into its main lines a substantial amount of new heavy rail until it now has 6,934 miles of 90 pound rail and 2,296 miles of 85 pound rail, a total of 9,230 miles of heavy rail, or 72 per cent of all its main and branch lines. Beginning January 1, 1925, the Company has adopted 110 pound rail as its standard for the transcontinental line and will insert 447.5 miles of this weight during the year, as well as 159.5 miles of new 90 pound rail on other main lines.

During the year 1924 the Company paid out in pensions to its retired employees \$313,069.77, there being 819 pensioners on the roll at December 31, 1924, compared with \$271,824.75 paid in 1923 and 731 pensioners December 31, 1923. The pensioners have an average service of 29 years with the Company. During this same year death benefits were paid in 270 cases, amounting to \$294,595.76, compared with 295 cases amounting to \$338,869.58 in 1923. The average length of service of all cases in which death benefits were paid in 1924 was 15 years.

Beginning with the first quarter of 1925, the common stock dividend was raised from 6 per cent to 7 per cent per annum. During the war and subsequently, such great changes were made in wages, material costs, taxes and rates that it was impossible to determine satisfactorily what the Company could earn. Furthermore, threats of harmful legislation added to the uncertainty. While there are still many serious problems before the railroads, conditions seem more settled than for some time and roadway and equipment have been brought back into first class condition. Moreover, the average rate of interest on the outstanding indebtedness of the Company is but 4.08 per cent per annum with no large sum maturing before 1958. Therefore, although the earnings of the Company were but 5.43 per cent on its investment, falling short of a fair return, it seemed that the dividend could be increased safely to 7 per cent.

Your Directors again take pleasure in recording their appreciation of the faithful and efficient service rendered by officers and employees.

W. B. STOREY,
President.

Thirtieth Annual Report of Central of Georgia Railway Company

Year Ended December 31, 1924

Report of the Board of Directors

SAVANNAH, Ga., March 11, 1925.

To the Stockholders:

The Board of Directors herewith submits the following report for the year ended December 31, 1924.

Income

Details are shown in Table 2.

Non-Operating Income

The decrease of \$1,829,554.78 (63.80%) in "Non-Operating Income" is due mainly to the following decreases:

Extra dividend from Ocean Steamship Company of Savannah..	\$1,999,000.00
Interest from securities of United States Government.....	87,648.00
Offset in part by the following increases—	
Dividend from Atlantic Compress Company.....	61,000.00
Dividend from The Western Railway of Alabama.....	15,000.00
Interest from Charleston and Western Carolina Railway Company bonds	15,890.00
Interest from special deposits.....	117,441.00
Interest during construction.....	33,016.00

Deductions from Gross Income

The increase of \$201,937.02 (6.40%) in "Deductions from Gross Income" is due mainly to the following increases:

Interest on funded debt.....	\$282,590.00
Amortization of discount on funded debt.....	20,488.00
Offset in part by decrease in interest on non-negotiable debt to affiliated companies.....	79,576.00

Transportation Operations

Details are shown in Table 2.

Railway Operating Revenues

"Railway Operating Revenues" increased \$974,363.03 (3.72%). "Freight Revenue" increased \$1,334,619.78 (7.40%). The tons of revenue freight carried one mile were 1,631,957,160 an increase of 9,212,707 ton miles (0.57%). The average revenue per ton was \$2.18 as compared with \$2.14 for the previous year, and the average revenue per ton mile was 1.19 cents as compared with 1.11 cents for the previous year.

"Passenger Revenue" decreased \$296,839.38 (5.23%). Revenue Passengers carried one mile were 170,791,575 a decrease of 9,237,410 (5.13%). Average revenue per passenger per mile was 3.15 cents as compared with 3.15 cents for the previous year.

"Mail Revenue" increased \$20,831.72 (4.34%).

"Other Passenger Train," "Other Transportation," "Incidental" and "Joint Facility" revenues, increased \$47,680.27 (4.33%).

Railway Operating Expenses

"Railway Operating Expenses" decreased \$67,019.29 (one-third of one per cent).

The increase of \$786,147.32 (23.02%) in "Maintenance of Way and Structures" was due mainly to retirements and expenses in connection with grade and line revision on Birmingham district and to an increase in the tonnage of new rail laid during the year.

The decrease of \$739,156.27 (13.19%) in "Maintenance of Equipment" was due to increased efficiency permitting a reduction in force and in number of hours worked.

Charges to "Maintenance of Equipment" for depreciation were \$723,511.68, an increase of \$78,230.45 (12.12%). The average miles per serviceable locomotive were 33,613, a decrease of 2,223 miles (6.20%). The average age of locomotives was 18.6 years, as compared with 18.3 for previous year.

"Traffic" expenses decreased \$11,831.65 (1.42%).

"Transportation" expenses decreased \$48,653.84 (.48%), due to increased efficiency in operation and a decrease in the price of fuel.

"General Expenses" increased \$74,055.62 (7.43%).

"Transportation for Investment—Credit" increased \$154,356.68 (629.65%), due to transportation in connection with the extensive additions and betterments work.

Railway Tax Accruals

"Railway Tax Accruals" were \$1,344,503.44 as compared with \$1,177,928.68 last year, an increase of \$166,574.76 (14.14%).

Uncollectible Railway Revenues

"Uncollectible Railway Revenues" amounted to \$20,542.48 as compared with \$35,910.53 last year, a decrease of \$15,368.05 (42.80%).

Equipment Rents—Net

The decrease of \$336,916.12 (161.93%) in net income from rental of equipment is due to three main causes:

Increase in traffic which necessitated the use of more foreign cars; increase in tonnage of those commodities which require a higher percentage of empty movement; and a decrease in average miles per car per day caused by carrying on line a large number of our hopper bottom coal cars for which there was no traffic.

Joint Facility Rents—Net

"Joint Facility Rents—Net (debit)" decreased \$58,172.03 (52.58%).

[ADVERTISEMENT]

Financial

The Balance Sheet, Table 4, reflects the general financial condition of your company at December 31, 1924, as compared with the previous year.

Central of Georgia Railway Company

TABLE 2
INCOME STATEMENT

Year Ended December 31,

	1924	Percent of Total Operating Revenues	1923	Percent of Total Operating Revenues	+Increase —Decrease
Average miles operated	1,920.64	....	1,920.64	....	.....
Railway Operating Revenues:					
I. Transportation—Rail Line:					
101. Freight	\$19,375,562.31	71.31	\$18,040,942.53	68.86	+\$1,334,619.78
102. Passenger	5,378,292.55	19.79	5,675,131.93	21.66	— 296,839.38
103. Excess baggage	38,202.89	.14	40,229.87	.15	— 2,026.98
104. Sleeping car	142,505.18	.52	152,094.00	.58	— 9,588.82
105. Parlor and chair car	12,652.89	.05	15,954.98	.06	— 3,302.09
106. Mail	500,546.74	1.84	479,715.02	1.83	+ 20,831.72
107. Express	771,000.00	2.84	902,929.36	3.45	— 131,929.36
108. Other passenger train	15,626.00	.06	8,795.74	.03	+ 6,830.26
109. Milk	17,373.49	.06	19,996.80	.08	— 2,623.31
110. Switching	315,420.77	1.16	317,249.15	1.21	— 1,828.38
111. Special service train	28,458.26	.10	15,615.50	.06	+ 12,842.76
Total	26,595,641.08	97.87	25,668,654.88	97.97	+ 926,986.20
III. Incidental:					
131. Dining and buffet	110,756.77	.41	91,477.17	.35	+ 19,279.60
132. Hotel and restaurant	4,434.60	.02	4,160.07	.02	+ 274.53
133. Station train and boat privileges	23,888.82	.09	29,733.29	.11	— 5,844.47
134. Parcel room	91.80	..	371.57	..	— 279.77
135. Storage	69,368.02	.25	77,123.55	.29	— 7,755.53
136. Storage	1,228.87	..	1,297.53	..	— 68.66
137. Demurrage	84,892.20	.31	74,220.54	.28	+ 10,671.66
141. Power	5,142.74	.02	4,048.61	.02	+ 1,094.13
142. Rents of buildings and other property	4,226.04	.02	3,895.68	.02	+ 330.40
143. Miscellaneous	223,650.09	.82	200,456.68	.77	+ 23,193.41
Total	527,679.99	1.94	486,784.69	1.86	+ 40,895.30
IV. Joint Facility:					
151. Joint facility—Cr.	50,643.16	.19	43,853.26	.17	+ 6,789.90
152. Joint facility—Dr.	754.85	..	446.48	..	+ 308.37
Total	49,888.31	.19	43,406.78	.17	+ 6,481.53
Total railway operating revenues	27,173,209.38	..	26,198,846.38	..	+ 974,363.03
Railway Operating Expenses:					
201-280. Maintenance of way & structures	4,201,129.18	15.46	3,414,981.86	13.03	+ 786,147.32
301-337. Maintenance of equipment	4,866,691.16	17.91	5,605,847.43	21.40	— 739,156.27
351-359. Traffic	823,286.58	3.03	835,118.23	3.19	— 11,831.65
371-420. Transportation—Rail line	10,148,631.50	37.35	10,197,285.34	38.92	— 48,653.84
441-446. Miscellaneous operations	139,963.02	.51	113,186.81	.43	+ 26,776.21
451-462 General	1,070,220.65	3.94	996,165.03	3.80	+ 74,055.62
471. Transportation for investment—Cr.	178,871.33	.66	24,514.63	.09	+ 154,356.68
Total railway operating expenses	21,071,050.76	77.54	21,138,070.05	80.68	— 67,019.29
Net revenue from railway operations	6,102,158.62	22.46	5,060,776.30	19.32	+ 1,041,382.32
532. Railway Tax Accruals	1,344,503.44	4.95	1,177,928.68	4.50	+ 166,574.76
533. Uncollectible Railway Revenues	20,542.48	.08	35,910.53	.14	— 15,368.05
Railway operating income	\$4,737,112.70	17.43	\$3,846,937.09	14.68	+ \$890,175.61

	1924	1923	+Increase —Decrease
Railway operating income—brought forward	\$4,737,112.70	\$3,846,937.09	+ \$890,175.61
Additions to Railway Operating Income:			
503. Hire of freight cars—Credit balance .....	.....	197,809.63	— 197,809.63
504. Rent from locomotives	33,640.75	27,767.53	+ 5,873.22
505. Rent from passenger-train cars	101,748.87	124,122.32	— 22,373.45
507. Rent from work equipment	22,290.06	10,283.76	+ 12,006.30
508. Joint facility rent income	140,080.99	63,298.13	+ 76,782.86
Total additions to railway operating income	297,760.67	423,281.37	— 125,520.70
Deductions from Railway Operating Income:			
536. Hire of freight cars—Debit balance	109,524.53	.....	+ 109,524.53
537. Rent for locomotives	28,109.29	25,318.50	+ 2,790.79
538. Rent for passenger-train cars	146,905.11	123,699.72	+ 23,205.39
540. Rent for work equipment	1,988.33	2,896.48	— 908.15
541. Joint facility rents	192,543.56	173,932.73	+ 18,610.83
Total deductions from railway operating income	479,070.82	325,847.43	+ 153,223.39
Net railway operating income	4,555,802.55	3,944,371.03	+ 611,431.52
Non-Operating Income:			
502. Revenues from miscellaneous operations	28,370.89	31,375.94	— 3,005.05
509. Income from lease of road	43,299.64	45,299.64	.. ..
510. Miscellaneous rent income	107,218.06	106,154.14	+ 1,063.92
511. Miscellaneous non-operating physical property	58,666.06	49,069.87	+ 9,596.19
513. Dividend income	515,833.25	2,430,789.00	— 1,914,955.75
514. Income from funded securities	109,030.51	180,630.29	— 71,599.78
515. Income from unfunded securities and accounts	173,600.92	24,262.03	+ 149,338.89
519. Miscellaneous income	16.00	9.20	+ 6.80
Total non-operating income	1,038,035.33	2,367,590.11	— 1,829,554.78
Gross income	5,593,837.88	6,811,961.14	— 1,218,123.26
Deductions from Gross Income:			
534. Expenses of miscellaneous operations	22,096.54	40,497.51	— 18,400.97
542. Rent for leased roads	372,959.22	372,710.47	+ 248.75
543. Miscellaneous rents	147,008.23	154,253.57	— 7,245.34
546-A. Interest on funded debt	2,686,240.43	2,403,649.81	+ 282,590.62
546-B. Interest on non-negotiable debt to affiliated companies	38,372.53	117,948.18	— 79,575.65
547. Interest on unfunded debt	4,927.04	1,613.99	+ 3,313.05
548. Amortization of discount on funded debt	67,861.36	47,177.85	+ 20,683.51
551. Miscellaneous income charges	18,078.67	17,755.62	+ 323.05
Total deductions from gross income	3,357,544.02	3,155,607.00	+ 201,937.02
Net income	\$2,236,293.86	\$3,656,354.14	— \$1,420,060.28

Capital Stock:

There were no changes in capital stock.

Funded Debt:

Note maturing January 24, 1924, and twelve unmatured notes, to United States Government totaling \$206,180, unpaid balance of loan dated January 24, 1921, were retired, releasing \$300,000 of Refunding and General Mortgage 6% Series A Bonds pledged therefor.

\$100,000 certificates of Equipment Trust "L," \$66,000 certificates of Equipment Trust "N," and \$194,000 certificates of Equipment Trust "O" matured and were retired.

\$30,000 of Upper Cahaba Branch First Mortgage Bonds and \$30,000 of Greenville and Newnan Main Line First Mortgage Bonds matured and were retired.

Five notes \$63,663.30 each, totaling \$318,316.50 known as Equipment Purchase Notes, Series 1, were issued August 2, 1924 in favor of Pullman Car and Manufacturing Corporation for approximately 75% of the cost of 4 all steel open passenger coaches, 2 all steel partition passenger coaches, 4 all steel baggage and express cars and 2 all steel combination baggage and coach cars, all of which were received and put in service during the year. These notes bear interest at 5½% per annum and mature respectively one, two, three, four and five years from date of issue.

To December 31, 1924, \$16,000,000 of Refunding and General Mortgage Bonds maturing 1959, Series A (6%) and Series B (5½%), were authenticated and placed in the treasury. In 1919 \$11,000,000 Series A 6% Bonds were pledged as security for \$8,000,000 10-Year 6% Secured Bonds maturing 1929. On April 1, 1924, your Company issued at a satisfactory price \$5,000,000 5½% Bonds of Series B to reimburse the treasury for past additions and betterments and to provide funds for further capital expenditures, chiefly revision of grades and alignment on the Birmingham District. These \$5,000,000 of 5½% Refunding and General Mortgage

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Bonds, Series B, are the only bonds under that mortgage outstanding in the hands of the public.

Other Indebtedness:

Non-negotiable debt to affiliated companies decreased \$80,000, reducing the amount to \$500,080. The company has no floating debt.

Dividends:

During the year dividends Nos. 20 and 21 (total \$1,200,000) at the rate of six per cent per annum, were declared and paid.

Physical Changes

The following is a summary of important improvements during the year, the cost of which was wholly or in part charged to investment accounts:

Roadway and Structures:

98.4049 miles of main track were relaid with new 90 pound steel rail; 7.9298 miles were relaid with new 80 pound steel rail. Of the new rail 23.6476 miles replaced rail of the same weight and 82.6871 miles replaced rail of lighter weight. 33.0231 miles of track were relaid with second hand steel rail, replacing rail of lighter weight. 7.7833 miles of track were relaid with second hand steel rail, replacing rail of the same weight. Total mileage of track relaid with new and second hand steel rail was 147.1411.

84 new industrial tracks aggregating 13.1352 miles were added, while 24 industrial tracks aggregating 3.0014 miles were removed; a net increase of 60 industrial tracks and a net increase of 10.1338 miles.

24 new company sidings aggregating 3.6298 miles were added, while 19 company sidings aggregating 1.6017 miles were removed; a net increase of 5 company tracks and a net increase of 2.0281 miles.

7.04 miles of track were constructed at Barrons Lane, Ga., and 1.33 miles were constructed at Ft. Valley, Ga., to facilitate the handling of peaches at those localities.

88.23 miles of ballasted track were repaired or renewed to restore the track to its original standard. 92.68 miles of unballasted track were ballasted.

5,491 lineal feet of pile and timber trestles were replaced by permanent culverts and embankment, and 6,201 lineal feet of untreated pile and timber trestles were rebuilt in creosoted material to conform to standard.

2,584 lineal feet of cast iron and reinforced concrete pipe and reinforced concrete boxes were installed to provide waterways for trestles filled, and 4,395 lineal feet of cast iron and reinforced concrete pipe and reinforced concrete boxes were installed to replace crushed terra cotta pipes and wooden box drains.

523,762 cross ties were renewed, being equivalent to 181.56 miles of continuous track, or 7.62 per cent of all ties in track, including sidings.

A 150 ton, 50 foot platform, 4 Section Fairbanks Track Scale was installed at East Rome, Ga., replacing an 80 ton, 40 foot scale which had worn out.

14.2 miles of telephone lines were constructed during the year, representing 149,952 lineal feet of wire.

Nine highway crossing signal bells of the flash light type were installed for protection of dangerous grade crossings, one each at Forsyth, Ga., Hapeville, Ga., East Point, Ga., Byron, Ga., Oglethorpe, Ga., Powersville, Ga., Republic, Ga., Muscogee Junction, Ga., and North Columbus, Ga.

Six new water tanks were erected during the year:

A 150,000 gallon high service reinforced concrete water tank, a 1,000,000 gallon ground storage reservoir, and an automatic electric pump driven by a ten horse power motor were installed at Gordon, Ga., replacing a 50,000 gallon wooden tank.

A 100,000 gallon steel tank with three ten inch penstocks, and pipe line, and new pump house, with a pump and electric driven motor were erected at Union Springs, Ala., replacing two 6,800 gallon wooden box tanks and steam pumping plant.

A 50,000 gallon low service creosoted tank was erected and connected with city main at Metter, Ga., replacing a 28,000 gallon cypress tank at M. P. 84 Oconee District.

A 50,000 gallon creosoted wooden tank was erected and a ten inch penstock installed at Griffin, Ga., replacing a 20,000 gallon cypress tank.

A 50,000 gallon creosoted water tank, pipe line and pump house were erected on the Florala District at Hardwood, Ala., replacing facilities at Blakely, Ga., destroyed by fire.

At Ocmulgee River, 190.0, Savannah District, a new bridge was built to replace the old one which had become inadequate to carry the heavier equipment now in use. The new bridge consists of eight steel deck plate girder spans. Four of these spans are 80 feet, two 68 feet and two 45 feet in length. The old piers were raised with concrete to make up the difference in depth between the trusses which were removed and the girders which were installed. Two new piers were constructed, one in the middle of each of the old truss spans, and concrete abutments were built at

each end of the new bridge. Total length of the new bridge is 546 feet.

At Alabama Road crossing near Rome, Ga., a new steel bridge was built in order to widen the street, increase the headroom and permit street car tracks to be laid. This bridge consists of a 106 foot through plate girder span on two concrete abutments, replacing a 61½ foot deck plate girder span.

At M. P. 223.3, Albany District, a new creosoted timber overhead highway bridge was constructed.

At Eleventh Street, Columbus, Ga., was constructed an underpass 700 feet in length, of concrete walls and roof, carrying main line and yard tracks, providing two 20 foot roadways and one eight foot sidewalk for public traffic, and replacing timber structures.

At Little River, A-213.6 Covington District, work on a new bridge was started, to consist of two steel deck truss spans and one deck plate girder span, released from Ocmulgee River Bridge at Macon, supported on three new concrete piers and one new concrete abutment, with three panels of new creosoted ballast deck trestle approach at one end.

At Alcovy River, A-246.9 Covington District, work on a new bridge was started, to consist of three 50 foot plate girder spans on concrete piers, and a 187 foot five pile open deck creosoted timber trestle.

At Columbus, Ga., work was started on an encased steel and reinforced concrete viaduct on Thirteenth Street, approximately 1,890 feet in length, providing a 40 foot roadway and two six foot side walks for public traffic to carry Thirteenth Street over our tracks from 5th Avenue to 10th Avenue. The work will be completed the early part of next year, at which time your company has authority to close 12th and 13th Streets to all traffic across its tracks. This work was about 85 percent completed at end of the year.

New coach and paint shops were erected at Savannah, Ga., replacing structures destroyed by fire November 16, 1923. At the close of the year the coach shop was 100 percent and the paint shop 90 percent completed.

A new brick store and oil house was constructed at Columbus, Ga.

Work was started on revision of line and grades on the Birmingham District between Columbus and Oak Mountain Tunnel, a distance of approximately 135 miles. The improvements will reduce the maximum gradient eastbound from one and one-quarter per cent to one-half of one per cent. The changes will eliminate 83 curves, a total of 3,167 degrees of curvature; 1,049 feet of rise and fall; 40 highway grade crossings; two railroad grade crossings and 2,426 feet of pile and frame trestles. At the end of the year about 40 per cent of the grading had been completed.

Equipment:

Ten mikado locomotives were purchased from Lima Locomotive Works. Two mogul freight locomotives were sold, making a net increase of eight locomotives and an increase of 583,365 pounds in tractive power.

Four all steel open coaches, four all steel baggage and mail cars, three all steel express cars, two all steel partition coaches and two all steel baggage and seat cars were purchased from Pullman Car and Manufacturing Corporation.

Thirteen all steel coal cars in 19000-20499 series were rebuilt at Columbus Shops and numbers changed to 20501 series.

Ten steel underframe cabooses, two tank cars and three roadway cars were built at Macon Shops.

One ditcher was purchased.

General

The attached tables exhibit the financial condition of your company and the result of the year's transactions.

With deep sorrow the Directors announce the death on October 8, 1924, of George J. Mills, a former Director of your company's predecessor, The Central Railroad and Banking Company of Georgia, 1892 to 1895, and a Director of your company continuously from July 22, 1896, until his death. The Board has appropriately recorded its appreciation of his high character and valued service.

With deep sorrow the Directors announce the death on February 15, 1925, of Captain James Warren English, in his twenty-fourth year as a Director of this company. The Board has recorded its appreciation of his high character and valued service.

The directors announce with much regret the resignation of Samuel R. Jaques due to his impaired health. Mr. Jaques had served as a Director for twenty-eight years.

The Board of Directors takes this opportunity to express its appreciation of the integrity, efficiency and united efforts displayed by your officers and employees in the discharge of their duties.

By order of the Board of Directors.

CHARLES H. MARKHAM,
Chairman of the Board.

[ADVERTISEMENT]

(Continued from page 1008)

cumstances which exist in the present case of the Gould executors. The Supreme Court is asked to decide whether the act is retro-active.

ERIE.—1924 Earnings.—Annual report for 1924, issued this week, shows net income after charges of \$9,601,629, equivalent, after allowing for 4 per cent dividends on the first and second preferred stocks, to \$6.26 a share on the common. The net income of 1923 was \$8,435,272, equivalent, after allowance for dividends on the preferred stock, to \$5.22 a share on the common. Selected items from the income statement follow:

ERIE			
	1924	1923	Increase or decrease
Railway operating revenues.....	\$119,096,856	\$132,978,455	—\$13,881,599
Maintenance of way.....	\$13,730,008	\$14,307,569	—\$577,560
Maintenance of equipment.....	29,554,255	36,054,579	—6,500,324
Transportation	46,080,879	51,319,167	—5,238,288
Total operating expenses.....	\$95,784,775	\$108,070,145	—\$12,285,370
Net revenue from operations....	\$23,312,081	\$24,908,310	—\$1,596,229
Railway tax accruals.....	4,521,873	4,260,003	261,869
Railway operating income.....	\$18,698,549	\$20,539,117	—\$1,840,568
Equipment fund joint facility rents—Dr.	1,626,372	2,218,704	—592,332
Net railway operating income....	\$17,072,177	\$18,320,413	—\$1,248,236
Non-operating income.....	7,709,746	4,791,317	2,918,429
Gross income	\$24,781,924	\$23,111,730	\$1,670,193
Total deductions from gross income	\$15,180,295	\$14,676,458	\$503,837
Net income	\$9,601,629	\$8,435,273	\$1,166,356
Applied to sinking and other reserve funds	\$1,238,262	\$1,217,065	\$21,197
Surplus for year carried to profit and loss	\$8,363,367	\$7,218,208	\$1,145,159

The annual meeting of the Erie held on March 14 was adjourned until June 15 for the election of directors, this procedure being considered best, pending the results of the hearings on the Nickel Plate merger beginning in Washington on Wednesday.

ILLINOIS CENTRAL.—1924 Earnings.—Annual report shows net income after charges for 1924 of \$16,248,558, equivalent, after the 6 per cent dividends on the \$20,997,480 preferred stock, to \$12.39 a share on the \$120,826,792 outstanding common stock. Net earnings in 1923 were \$15,485,074, equivalent, after 6 per cent dividends on \$10,702,200 preferred stock, to \$13.55 a share on \$109,522,091 common stock. The figures which follow include the results of operation of the Yazoo & Mississippi Valley which have heretofore been reported separately:

ILLINOIS CENTRAL			
	1924	1923	Increase or decrease
Average mileage operated.....	6,218	6,209	9
Railway operating revenues	\$173,838,132	\$186,763,167	—\$12,925,035
Maintenance of way.....	23,921,030	29,012,993	—5,091,963
Maintenance of equipment.....	39,359,636	43,737,749	—4,378,114
Transportation	63,404,919	69,934,259	—6,529,339
Total operating expenses.....	134,024,921	150,023,276	—15,998,356
Operating ratio	77.10	80.33	3.23
Net revenue from operations.....	39,813,211	36,739,890	3,073,321
Railway tax accruals	12,722,493	11,048,431	1,674,062
Railway operating income.....	27,033,816	25,664,062	1,369,754
Equipment rents, net cr.....	613,236	Dr. 1,361,784	1,975,020
Joint facility rents, net cr.....	455,022	561,161	—106,140
Net railway operating income.....	28,102,073	24,863,440	3,238,634
Non-operating income.....	3,577,826	4,907,859	—1,330,033
Gross income	31,679,900	29,771,299	1,908,601
Rent for leased roads.....	1,758,575	1,704,438	54,137
Interest on funded debt.....	12,922,526	12,192,089	730,447
Total deductions from gross income.	15,431,342	14,286,225	1,145,117
Net income	16,248,558	15,485,074	763,484
Divs. on pref. stock, 6 per cent..	1,276,740	642,204	.....
Divs. on com. stock, 7 per cent...	7,876,286	7,666,438	.....

LOUISVILLE & NASHVILLE.—1924 Earnings.—The annual report shows net income after charges of \$14,132,794, equivalent to \$12.07 a share on outstanding capital stock. This compares with \$13,498,935 or \$11.54 a share in 1923. Selected items from the income statement follow:

LOUISVILLE & NASHVILLE		1924	1923
Railway operating revenues.....		\$135,505,677	\$136,375,673
Maintenance of way.....		\$19,792,804	\$18,285,584
Maintenance of equipment		31,731,417	34,429,992
Transportation		49,510,658	50,987,533
Total operating expenses.....		\$107,126,897	\$109,865,090
Net revenue from operations.....		\$28,378,780	\$26,510,583
Railway tax accruals.....		6,189,994	6,372,310
Railway operating income.....		\$22,154,034	\$19,946,272
Equipment rents, net cr.....		\$448,911	\$938,977
Joint facility rents, net dr.		311,571	212,106
Net railway operating income.....		\$22,291,374	\$20,673,143
Non-operating income		3,016,252	2,926,429
Gross income		\$25,307,626	\$23,599,572
Interest on funded debt.....		\$10,792,167	\$9,746,846
Total deductions from gross income.....		\$11,174,832	\$10,100,637
Net income		\$14,132,794	\$13,498,935
Disposition of net income:			
Dividends*		\$7,020,000	\$5,850,000

*6 per cent in 1924; 5 per cent in 1923.

MISSOURI-KANSAS-TEXAS.—New Directors.—At the annual meeting of the stockholders held in St. Louis on April 10, four new directors were elected as follows: L. F. Loree of New York, president of the Delaware & Hudson and chairman of the Board of the Kansas City Southern; Samuel W. Fordyce of St. Louis; Moritz Rosenthal of New York, and William Wiseman of New York. They succeeded Frank O. Watts of St. Louis, Edward Tinker, Edwin G. Merrill, and Harry Black of New York. Other directors were re-elected. The four new directors are understood to represent the recently acquired interest of Kuhn, Loeb & Co. in the Katy. The majority interest in the property is still retained by Seligman & Company of New York and it is believed that the election of the four new directors will bring the Missouri-Kansas-Texas in closer relationship with the Kansas City Southern.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—Directors.—At the annual meeting held in Nashville this week, Thomas N. Greer, of Shelbyville, Tenn., was elected a director succeeding V. E. Schwab, deceased.

NEW YORK, NEW HAVEN & HARTFORD.—Annual Meeting.—At the annual meeting held in New Haven this week, stockholders authorized a lease for 25 years of an unused portion of the New Haven right of way between Larchmont, N. Y., and Mamaroneck to the New York, Westchester & Boston, a subsidiary company, for extension of the lines of the latter. Authorization was also given for the issuance of bonds to refund obligations maturing up to 1930; to pay for or reimburse the treasury for expenditures for equipment not exceeding \$3,000,000; to change the rate of interest on bonds and notes heretofore issued. Stockholders also ratified action of the company in connection with the maturity of the \$23,000,000 15-year 6 per cent loan on April 1, 1925.

NORTHERN PACIFIC.—1924 Earnings.—Northern Pacific annual report made public at the annual meeting on Tuesday shows net income after charges of \$15,970,244, equivalent to \$6.44 a share earned on \$248,000,000 outstanding stock. Earnings in 1923 totaled \$12,981,426, equivalent to \$5.23 a share. Selected items from the income statement follow:

NORTHERN PACIFIC		1924	1923	Increase or decrease
Average mileage operated.....		6,680	6,669	11
Railway operating revenues.....		\$95,292,404	\$102,002,060	—\$6,709,656
Maintenance of way.....		\$12,240,855	\$14,022,694	—\$1,781,838
Maintenance of equipment.....		18,675,927	22,464,342	—3,788,415
Transportation		34,190,334	38,535,417	—4,345,083
Total operating expenses.....		\$70,533,064	\$80,364,810	—\$9,831,746
Operating ratio		74.02	78.79	4.77
Net revenue from operations.....		\$24,759,340	\$21,637,250	\$3,122,090
Railway tax accruals.....		8,546,758	8,462,891	83,867
Railway operating income.....		\$16,196,186	\$13,154,931	\$3,041,255
Equipment rents, net Cr.....		\$2,130,763	\$2,404,238	—\$273,475
Joint facility rents, net Cr.....		1,534,128	1,541,389	—7,260
Net railway operating income....		\$19,861,077	\$17,180,557	\$2,760,520
Non-operating income		11,483,432	11,181,676	301,756
Gross income		\$31,344,508	\$28,282,233	\$3,062,276

Rent for leased roads.....	\$51,321	\$51,321	.....
Interest on funded debt.....	14,767,619	14,707,679	\$59,939
Total deductions from gross income.....	\$15,374,264	\$15,300,807	\$73,457
Net income.....	\$15,970,244	\$12,981,426	\$2,988,818
Disposition of net income:			
Dividends, 5 per cent.....	\$12,400,000	\$12,400,000	.....
Surplus for year carried to profit and loss.....	\$3,570,244	\$581,426	\$2,988,818

At the annual meeting John Sloan and Gerald Livingston were elected directors, succeeding Arthur Curtiss James and Crawford Livingston.

PENNSYLVANIA.—Authorized to Issue Bonds.—The Interstate Commerce Commission has granted authority to the Pittsburgh, Cincinnati, Chicago & St. Louis for its recent issue of \$26,000,000 general mortgage, 5 per cent bonds, series B. It has also granted authority to the Pennsylvania Railroad Company to assume as lessee and guarantor, obligation and liability with respect to such bonds. This issue was sold to Kuhn, Loeb & Co., and by the latter to the public as noted in the *Railway Age* of March 14.

READING COMPANY.—Equipment Trusts.—The Interstate Commerce Commission has granted authority for the issuance of \$7,500,000 of equipment trust certificates, series L, to be issued under an agreement dated October 1, 1924, and sold at not less than par. The equipment covered by the trust certificates includes 30 locomotives, 3,000 freight cars, 30 passenger cars and 1 gasoline electric motor car at a total approximate cost of \$9,122,959.

SEABOARD AIR LINE.—Authorized to Issue Bonds.—The Interstate Commerce Commission has granted authority to this company to issue refunding mortgage bonds in an amount which, when taken at their fair market value at the time of the pledge, will not exceed \$873,977, these bonds to be pledged under applicant's first and consolidated mortgage. The company has also been granted authority to procure authentication and delivery of \$1,025,500 of first and consolidated mortgage gold bonds due 1945, 6 per cent, series A, and to pledge and repledge from time to time such bonds as collateral security for short-term notes.

ST. LOUIS-SAN FRANCISCO.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and pledge \$2,776,248 of prior lien mortgage 5½ per cent bonds and to issue and hold in the treasury \$5,434,811 of adjustment mortgage 6 per cent bonds.

UNION PACIFIC.—New Director.—Oliver Ames of Boston has been elected a director to succeed W. A. Clark, deceased.

WABASH.—Notes.—This company has applied to the Interstate Commerce Commission for authority to issue, in subdivision of a note previously held by the director general of railroads and sold by him, \$1,500,000 of 6 per cent secured notes, and to pledge as collateral \$729,000 of consolidated mortgage 4 per cent bonds of the Chicago & Western Indiana and 1,217 shares of stock of the American Refrigerator Transit Company.

YAZOO & MISSISSIPPI VALLEY.—Acquisition.—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific by lease.

YAZOO & MISSISSIPPI VALLEY.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$3,493,000 of 5 per cent improvement bonds to be delivered to the Illinois Central in payment for advances.

Dividends Declared

Hudson & Manhattan.—Common, 1¼ per cent, semi-annually, payable June 1 to holders of record May 14.
International Railways of Central America.—Preferred, 1¼ per cent, quarterly, payable May 15 to holders of record April 30.

Trend of Railway Stock and Bond Prices

	April 14	Last Week	Last Year
Average price of 20 representative railway stocks.....	77.65	77.65	62.50
Average price of 20 representative railway bonds.....	89.67	89.99	85.20

Railway Officers

Financial, Legal and Accounting

J. H. Barron has been appointed auditor of freight and passenger accounts of the St. Louis Southwestern of Texas, succeeding M. B. Grimes, deceased.

H. A. Scandrett, valuation counsel and commerce counsel of the Union Pacific, with headquarters at Omaha, Neb., has been elected vice-president, with the same headquarters.

J. D. Brown has been appointed paymaster of the Missouri Pacific, with headquarters at St. Louis, Mo., succeeding T. L. Harkness, whose death on April 3 was reported in the *Railway Age* of April 11.

Arthur Van Meter has been appointed general attorney of the Monongahela and the Pittsburgh, Chartiers & Youghiogheny, with offices at Pittsburgh, Pa., succeeding Albert Ward, who has resigned to accept service with another company.

R. G. Streit, assistant comptroller of the Chicago, Indianapolis & Louisville, with headquarters in Chicago, has been promoted to comptroller, with the same headquarters, succeeding **H. T. Evans**, whose death on February 21 was reported in the *Railway Age* of February 28. **E. C. Meyer** has been appointed assistant comptroller, with headquarters at Chicago, succeeding Mr. Streit. Mr. Streit was born on March 7, 1889, at Chicago, and entered railway service in 1907 as a clerk in the office of the auditor of expenditures of the Chicago, Burlington & Quincy. He was employed as a clerk in the auditor's office of the Chicago, Indianapolis & Louisville in October, 1909, and was promoted to chief clerk on May 1, 1914. During federal control Mr. Streit served as federal auditor and at the termination of that period on March 1, 1920, was appointed assistant comptroller, in which position he remained until his recent promotion to comptroller.

Operating

L. P. Hopkins has been appointed trainmaster of the Coast division of the Southern Pacific, with headquarters at Watsonville Junction, Cal., succeeding **L. C. Gram**, who has been assigned to other duties.

N. A. Williams, general superintendent of the Los Angeles & Salt Lake, with headquarters at Los Angeles, Cal., has been transferred to the Northern district of the Union Pacific, with headquarters at Cheyenne, Wyo., succeeding A. W. Woodruff.

C. E. Maxfield has been appointed superintendent of the Cleveland division of the New York, Chicago & St. Louis, with headquarters at Cleveland, O., succeeding A. C. Showalter, who has been promoted. The position of assistant superintendent has been abolished.

P. F. Keating, general superintendent of the Eastern district of the Great Northern, with headquarters at St. Paul, Minn., has resigned. As reported in the *Railway Age* of April 11, the jurisdiction of F. J. Gavin, general superintendent of the Lake district, has been extended over the Eastern district.

V. S. Andrus, assistant superintendent of transportation of the Southern Pacific, with headquarters at San Francisco, Cal., has been promoted to assistant to the general manager, with the same headquarters, and the position of assistant superintendent of transportation has been abolished.

Aquilla C. Showalter, division superintendent of the New York, Chicago & St. Louis, with headquarters at Cleveland, O., has been appointed general superintendent of the Nickel Plate district, with the same headquarters. Mr. Showalter was born on November 15, 1865, at Akron, O., and was educated in the public schools at Lorain, O. He entered railway service in May, 1882, as a telegraph operator on the Baltimore

& Ohio, which position he held until 1885, when he became agent and telegraph operator on the New York, Chicago & St. Louis. This position he held until 1899, when he became district passenger agent for the same road. From 1903 to 1915, he was freight agent at Buffalo, N. Y., and in 1915 was promoted to assistant superintendent of the Buffalo division. In 1917, he became superintendent of the Cleveland division, which position he held until his recent appointment.

Traffic

R. R. Seeds has been appointed general agent, freight department, of the Chicago, Rock Island & Pacific, with headquarters at Phoenix, Ariz., in charge of the newly established traffic agency.

J. F. McMahon, chief clerk to the general freight agent of the Illinois Central, with headquarters at Chicago, has been promoted to assistant coal traffic manager, with the same headquarters.

Mechanical

W. H. Flynn, superintendent of motive power of the Michigan Central, has been transferred in a similar capacity to the New York Central, Lines East, with headquarters at New York.

C. L. Gibson has been appointed master mechanic of the Stockton division of the Southern Pacific, with headquarters at Tracy, Cal., succeeding **H. H. Carrick**, whose promotion to superintendent of shops at Los Angeles, Cal., was reported in the *Railway Age* of April 11.

Merle R. Reed, who has been appointed assistant general superintendent of motive power of the Northwestern region of the Pennsylvania, with headquarters at Chicago, was born on June 26, 1883, at Newton, Ill. He attended Rose Polytechnic Institute from which he was graduated in June, 1905. Previous to this time he had served during the summer of 1904 as a laborer in the Terre Haute shops of the Pittsburgh, Cincinnati, Chicago & St. Louis, a subsidiary of the Pennsylvania. After his graduation he returned to the Terre Haute shops as a signal repairman. A few months later he resigned to become a special apprentice on the Union Pacific at Omaha, Neb. He returned to the Panhandle in September of the following year as a draftsman in the Terre Haute shops. In June, 1907, he was promoted to assistant foreman and in February, 1909, he became chief draftsman. In April, 1917, he was transferred to the Northwest System of the Pennsylvania, Lines West, as a general car inspector, and was promoted to superintendent of car repairs on the Pennsylvania, Lines West, in September, 1918. He was appointed master mechanic of the Eastern division in August, 1919, and when the administration of the Pennsylvania was reorganized in March, 1920, he was transferred to the Logansport division as master mechanic, which position he held until the time of his recent promotion.

J. F. Jennings has been appointed superintendent of motive power of the Michigan Central, succeeding **W. H. Flynn**, who has been promoted to service on the New York Central. **F. P. Neesley**, division master mechanic at Jackson, Mich., has been appointed assistant superintendent of motive power, succeeding **Mr. Jennings**. **C. W. Adams**, superintendent of shops at Jackson, has been appointed division master mechanic at Jackson, Mich., succeeding **Mr. Neesley**. **W. R. Benson**,

superintendent of shops at St. Thomas, Ont., has been appointed superintendent of shops at Jackson, Mich., succeeding **Mr. Adams**.

W. F. Lauer, general foreman of shops of the Illinois Central at South Memphis, Tenn., has been promoted to master mechanic, with the same headquarters, succeeding **O. A. Garber**, whose appointment as mechanical superintendent of the Missouri Pacific, with headquarters at St. Louis, was reported in the *Railway Age* of March 7.

Engineering, Maintenance of Way and Signaling

B. H. Prater, engineer maintenance of way of the Oregon Short Line, with headquarters at Pocatello, Idaho, has been promoted to assistant chief engineer, with headquarters at Salt Lake City, Utah, succeeding **W. R. Armstrong**, promoted. **F. D. Nauman**, division engineer, with headquarters at Pocatello, has been promoted to engineer maintenance of way, with the same headquarters, succeeding **Mr. Prater**.

Purchasing and Stores

J. P. Murphy, general storekeeper of the New York Central, lines west, with headquarters at Collinwood, Ohio, has been given jurisdiction also over the Ohio Central lines, with the same headquarters. **E. H. Lehman**, general storekeeper of the Ohio Central lines, has been appointed assistant general storekeeper, with headquarters at Columbus, Ohio.

J. T. Kelly, district storekeeper of the Northern district of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been appointed chief stockman, with headquarters at Milwaukee, Wis., succeeding **H. L. Brillinger**, deceased. **G. T. Richards**, district storekeeper of the Southern district, has been transferred to the Northern district, with headquarters at Minneapolis, succeeding **Mr. Kelly**. **J. C. MacDonald** has been appointed district storekeeper of the Southern district, with headquarters at Dubuque, Iowa, succeeding **Mr. Richards**.

Special

E. H. Blackwell, special clerk in the pension department of the Pennsylvania, has been promoted to assistant superintendent of that department. **J. A. Huntzinger**, special agent in the relief department, has been promoted to assistant superintendent of that department.

Obituary

W. D. Young, general agent, freight department, of the Missouri Pacific, with headquarters at San Antonio, Tex., died on March 26.

O. L. Harrison, formerly treasurer of the Missouri Pacific, died at Brentmoor Park, Mo., on April 6, following a brief illness from influenza.

George E. Potter, division engineer on the New York, Chicago & St. Louis, with headquarters at Fort Wayne, Ind., died in that city on April 8, from heart failure.

A. R. Campbell, assistant superintendent of the Western division of the St. Louis-San Francisco, with headquarters at Enid, Okla., died on April 12 from pneumonia.

G. S. Fernald, general counsel of the Pullman Company, whose death at Pass Christian, Miss., on April 7, was reported in the *Railway Age* of April 11, was born on November 11, 1857, at Otisfield, Maine. He graduated from the Oxford Normal Institute of Paris, Maine, and studied law at Portland, Maine. Mr. Fernald entered railway service in August, 1882, as attorney for the Northern Pacific at Brainerd, Minn., where he remained until 1890, when he was promoted to tax commissioner. He held that position until 1905, serving also as special counsel for the receiver from 1893 to 1896. In 1905 he entered the service of the Pullman Company as assistant general solicitor and was promoted to general attorney in 1909. Mr. Fernald was promoted to general counsel in 1918 and held that position until his death.



M. R. Reed